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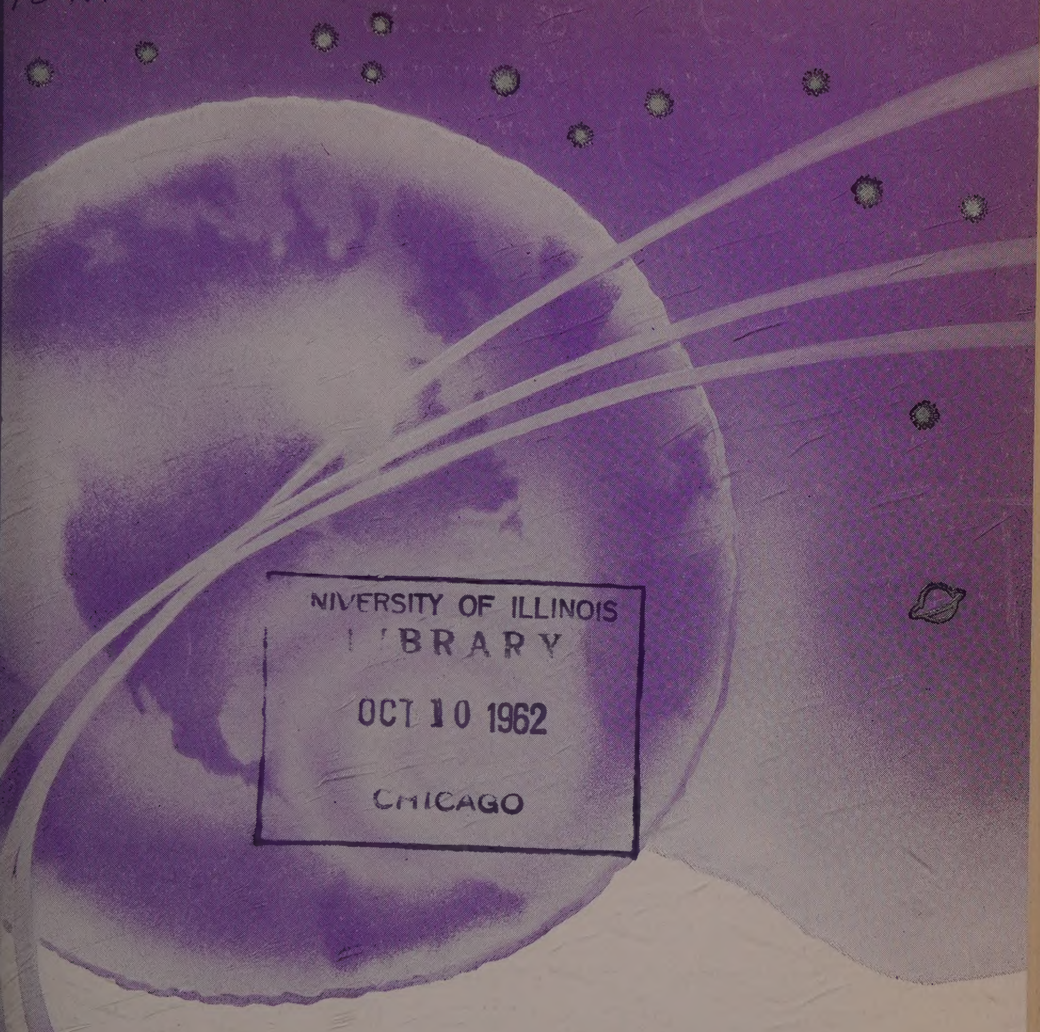

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METEOROLOGICAL AND GEOASTROPHYSICAL ABSTRACTS

MALCOLM RIGBY, Editor

Vol. 12 December 1961 No. 12, Part 2
[Pub. Sept. 1962]

PHYSICAL OCEANOGRAPHY

(A Compilation of Backlog Abstracts for 1950-59)

Compiled by: Evelyn Z. Sinha

Sponsored by
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FOREWORD

Meteorological and Geoastrophysical Abstracts is a monthly publication devoted to current iterature in meteorology, geophysics and astrophysics.

Part I contains abstracts of current literature in the fields of meteorology, etc.

Part II of each issue comprises an annotated bibliography of important references on a special subject. Bibliographies published in the successive issues were:

Vol. I, 1950

1. **Atmos. Pollution, 2. Aerobiology, 3. Cloud Physics, 4. Hail, 5. Tornadoes, 6. Volcanic Dust, 7. Climat. Changes, 8. Thunderstorms, 9. Icing, 10. Acoust. Propagation, 11. Evaporation**

Vol. II, 1951

1. **Extended Forecast., 2. Long Range Forecast., 3. Soil Temp., 4. Constants, etc., 5. Clim. of Near East, 6. Clim. of Middle East, 7. Special Winds, 8. Radar Storm Detect., 9. Condensation Trails, 10. Clim. of N. E. Africa, 11. Mountain Met.**

Vol. III, 1952

1. **Clim. of N. W. Africa, 2. Carbon Dioxide, 3. Clim. of Argentina, etc., 4. Dew, 5. Objective Forecast., 6. Stratus Forecast., 7. Urban Climatology, 8. Clim. of C. Africa, 9. Visibility, 10. Glaze and Rime, 11. Free Air Turbulence**

Vol. IV, 1953

1. **Turbulence Theory, 2. Turbulent Diffusion, 3. Frost, 4. Clim. of Australia, etc., 5. High Level Winds, 6. Winds in Stratosphere, 7. Jet Stream, 8. Radiation Bioclim., 9. Clim. of Pacific, 10. Auroras, 11. Sferics**

Vol. V, 1954

1. **Oceanog. Met., 2. Clim. of S. E. Asia, 3. Auroral Physics, 4. Tropopause, 5. Balloons, 6. Numerical Forecast., 7. Radiation Data, 8. Vertical Motion, 9. Clim. of Arctic, 10. Industrial Met., 11. Wind Waves and Swell**

Vol. VI, 1955

1. **Bibliog. of Bibliog., 2. Texts & Monogr. Bibliogs., 3. Storm Surges, 4. Ionospheric Prop., 5. Photochem.—Upper Atmos., 6. Cloud Physics, 7. Radar Cloud Physics, 8–9. Atmos. Nuclei, 10. Weather Modification, 11. Cooling Power**

Vol. VII, 1956

1. **Synoptic Met.-Arctic, 2. Clim. of Enclosed Spaces, 3. Cosmic Rays (–1952), 4. Cosmic Rays (1953–56), 5. Atmos. Radioactivity, 6. Inversions, 7. Snow Micromet., 8. Snow Micromet. (Suppl.), 9–11. Tropical Cyclones**

Vol. VIII, 1957

1. **Solar Weather Relations, 2. Night Airglow, 3. Forecasting Special Elements, 4. Forest Micrometeorology, 5. Hydromet. Forecasting, 6. Numerical Forecast. (Suppl.), 7. Albedo, 8. Meteors, 9–10. Tropospheric Prop., 11. Medical Meteorology**

Vol. IX, 1958

1. **Radioastronomy, 2. Solar Astrophysics, 3. Radioactivity in Atmosphere, 4. Waves and Currents, 5. Physical Oceanog., 6. Dynamic & Phys. Oceanog., 7. Long Range Forecast., 8. Radar Met., 9. Cosmic Rays, 10–11. Geomagnetism**

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Vol. XI, 1960

1. Outstanding Reference Works 2. Outstanding Texts 3. Numerical Forecast. (Suppl.)
4. Ionospheric Physics 5. Ionospheric Propagation 6. Ionosphere
7. Forecast Verification 8. Radar Meteorology 9. Rocket Meteorology
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1. Aurora
2. Auroral Physics
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9. Waves and Currents
10. Cloud Physics (Suppl.)

Part III contains a listing of translations and the contents of important publications. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where th material may be found. The Union List of Serials (Gregory) is the source of most of th symbols used. In some cases, where no symbol has been assigned to a library, one will b devised according to the principles of the Union List.

Library symbols used frequently may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DBS:	U. S. Bureau of Standards Library, Washington, D. C.
DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DN-HO:	U. S. Navy Hydrographic Office Library, Suitland, Md.
DNLM:	U. S. National Library of Medicine, Washington, D. C. .
DP:	U. S. Patent Office Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by char

Geographic locations are in the English form rather than the form used locally, for examp Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwi stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet using a modific tion of the Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months a abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Numb (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus entry will read as follows:

Meteorologische Rundschau, 2(5/6):146–151, May/June 1950.

This indicates that the article appeared in *Meteorologische Rundschau, Jahrgang* 2 (V 2), *Heft* 5/6 (No. 5/6), *pages* 146–151, May/June 1950.

OCEANOGRAPHY

(A COMPILATION OF BACKLOG ABSTRACTS FOR 1950–1959)

Compiled by: Evelyn Z. Sinha

INTRODUCTION

This compilation is the fifth of several issues of *Meteorological and Geoastrophysical Abstracts,* ach containing abstracts of the literature on a specific aspect or on cognate aspects of meteorology. The abstracts were chosen from a backlog of over 12,000 unpublished abstracts which accumulated luring the past five or six years. The literature abstracted was taken from publications issued luring 1950–1959 in a dozen languages and from a score or more countries. The 1089 items in his compilation are arranged according to major fields of specialization in Oceanography. Cross eferences are provided where studies concern more than one aspect of the subject.

Three special issues appeared as supplements to Vol. X, 1959. These were:

1) **Instruments and Methods of Observation and Instrument Carriers** (551.501, –07, –08)
2) **Precipitation (rain, snow, hail) and Hydrometeorology** (551.577–79)
3) **Agricultural Meteorology** (551.5:63)

The fourth, fifth, and sixth supplementary issues of backlog material were deferred to Vol. XII in order not to delay the decennial Index for Vol. I–X and the Annual Index for Vol. XI. These three bibliographies are as follows:

4) **Forecasting and Synoptic Meteorology** (551.509)
5) **Oceanography** (551.46)
6) **Dynamic Meteorology, Atmospheric Circulation, Atmospheric Disturbances** (551.511, –13, –15)

These last three bibliographies are being published in 1962. The material in these compilations will be included in the Annual Index for Vol. XII, 1961.

These six special issues, comprising over 5,000 abstracts, are being compiled and published with he aid of funds provided by the National Science Foundation for this specific purpose. Original bstracting was performed chiefly with support from the Air Force Cambridge Research Center.

The following subject outline of the contents shows in detail the arrangement of the abstracts. An appended index of geographic locations points to abstracts of local and regional studies, and an lphabetical index of authors to the works of various writers. Finally there is an alphabetically rranged subject index.

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Ocean Prediction Techniques
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Tide forecasting, 12M–28, –869, –872

General

BOOKS

See also: **International Oceanographic Congress** (Sears) 12M–60; **Handbook of navigation** (Müller), 12M–74; **Exploration of the Atlantic** (Brochado) 12M–103; **Beaches and coasts** (King) 12M–366; **Use of Weather maps at sea** (U. S. Weather Bureau), 12M–570; **Oceanography and marine biology** (Barnes) 12M–624.

12M–1 551.464.08

†Barnes, M. (*Marine Station, Millport, Scotland*), **Apparatus and methods of oceanogra Pt. 1, Chemical.** N. Y., Interscience Publishers, **1959.** 341 p. 44 figs., tables, 45 table appendix, refs. at end of each ch., added refs. p. 269–272, eqs. Review by F. A. J. Armst in *Nature*, London, 184(4683):299–300, Aug. 1, 1959. Review by Herbert Curl, Jr., in *Eco* Durham, N. C., 40(4):746–747, Oct. 1959. **DWB** (551.46 B261ap)—A detailed handboo working manual on the analytical techniques used in Oceanographic chemistry determina Colorimetric and photometric analysis, errors and accuracy, calculations and calibration cu chlorinity, pH determinations by potentiometry, nitrates, nitrites, ammonia, organic nitrog sea-water and plankton, phosphates, organic phosphorous, silicates, organic carbon, oxygen, linity, carbon dioxide cycle, micromethods, trace metals, plankton pigments, filtration, and ph and chemical analysis of sediments are subjects of the 21 separate chapters. Scores of r literature references through 1957 and working tables, a subject and an author index are appe All types of apparatus are described and illustrated. *Subject Headings:* **1. Oceanogra chemistry techniques 2. Oceanographic chemistry apparatus 3. Chemical oceanogr handbooks.**—*M.R.*

12M–2 551.5(26)(02):5

†Benua, Konstantin M., **Meteorologiia.** [Meteorology.] 2d ed. Moscow, Gosud. Vo Morskoe Izdat NKVMF Soiuza SSR, **1941.** 502 p. 199 figs., forms, 33 refs. **DLC** (QC86

1941)—A textbook adapted to the program of meteorology in the Naval and Merchant Marine Academies. The material is arranged to meet requirements of the weather service on Russian naval and merchant vessels. Part one deals with the atmosphere, its physical characteristics and processes. Part two, entitled "Fundamentals of Weather Knowledge," deals with: 1) organization for synoptic purposes; 2) principal air masses; 3) modified air masses; 4) frontal surfaces; 5) cyclones; 6) anticyclones; 7) specific rules and methods used in the analysis of synoptic charts; 8) tropical cyclones, tornadoes and waterspouts; 9) the weather service (weather bulletins, manuscript synoptic charts, reporting and forecasting service, storm warning and ice service); 10) local signs. 13 appendices complete the book. Questions for students are appended to each chapter. *Subject Headings:* **1. Marine meteorology textbooks 2. Meteorology textbooks.**—*A.M.P.*

12M–3 551.46(26)(02)

†Zagrodzki, Karol, **Oceanografia dla marynarzy.** [Oceanography for mariners.] Warsaw, Wydawnictwa Komuniksvyjne, **1956.** 415 p. 301 figs. (many in color), 30 fold. maps (in color), 55 refs. **DLC** (GC28.Z3)—A sizable standard textbook on physical oceanography or hydrography emphasizing in the two major parts, the physical and chemical properties of sea water, and the dynamics of sea water, respectively. The historical chapter deals mainly with Russian and Polish expeditions, the organization of the hydrometeorological service in Poland, and the subsequent chapters deal with instruments and equipment, with submarine topography, tides, currents, ice, waves, temperature, salinity, etc. A large number of multi-colored maps of the oceans of the world, and hundreds of sketches of instruments of every type are included, as well as working tables. *Subject Headings:* **1. Oceanography textbooks 2. Hydrography 3. Polish language textbooks.**—*M.R.*

EDUCATION

See also: **Scripps vessel for 2 year study,** 12M–124.

12M–4 551.46:378

Fleming, Richard H. (*Univ. of Washington, Seattle*), **Present status and future development of oceanography.** *Pacific Science Congress, 8th, Philippines, Nov. 16–28, 1953, Proceedings,* Vol. 3-A; 1177–1196, pub. Univ. of the Philippines, **1957.** 4 tables, 4 refs. **DWB**—Oceanography is defined as the scientific study of the oceans and of their relations to man, i.e. to understand, to interpret, and to predict present, past and future conditions, respectively. Emphasis is placed on study of Paleo-oceanography, on the one hand (for understanding and interpretation) and on predicting where no understanding exists, for the latter will spur the former. Oceanography has just achieved status as a science (i.e., it has its own techniques and body of knowledge), and is recognized as a profession with academic standing and international status. The present and future importance of oceanography in international, national, academic circles is discussed. At present 8 U. S. universities give graduate courses and research in oceanography, but only one gives under-graduate work (Univ. of Wash.). Problems connected with undergraduate teaching of oceanography as well as advantages of such training are enumerated. No professional society exists, few textbooks are available and other teaching aids are non-existent. An appendix gives details of the programs of 27 U. S. and Canadian colleges and universities, plus number of graduate students at 13. *Subject Headings:* **1. Oceanography 2. Teaching of oceanography.**—*M.R.*

12M–5 551.464:378

Rakestraw, Norris W. (*Scripps Inst. Ocean. U. Calif., La Jolla*), **Training in chemical oceanography.** *Journal of Chemical Education,* 35:123–124, March **1958.** Reprinted as *California. Univ. Scripps Institution of Oceanography, Contributions, 1958,* issued **1959.** p. 87–88. Contribution No. 979. **DWB** (551.46 C153co 1958).—A paper offering some suggestions for the training of would-be chemical oceanographers, based on the assumption that the training is to lead to the Doctor's Degree. Simultaneously a discussion is presented of the expanding field of chemical oceanography pointing to the need of the proposed educational requirements. The undergraduate courses suggested in this paper indicate the necessity of a broad background. At this level or at the early graduate stage courses are recommended, not only in the field of chemistry and different branches of chemistry, but also in geology and biology, introductory training in theoretical and practical electronics and a reading knowledge of German and another foreign language. Graduate work should orient the student in the principal branches of oceanography and also in geophysics and geochemistry. At the doctoral level independent research combined with opportunities for field experience should be the main substance of training. *Subject Headings:* **1. Teaching of oceanography 2. Chemical oceanography.**—*I.S.*

12M–6 551.46:374.

Rigg, J. B. (*Watford Grammar School*), **Practical courses in elementary oceanography** *Weather*, London, 14(9):275–289, Sept. **1959.** 11 figs., 9 refs. **DLC**—This paper offers som practical guidance to those interested in providing opportunities to young school students for fiel experience in oceanography. It is based on the experience of week-long courses in oceanograph sponsored by Dale Fort Field Center, Pembrokeshire consisting of study at sea, either i trawlers or from an open boat. A variety of techniques are described which can be used profitabl and without much difficulty during such excursions. Numerous graphical representations illustrating these techniques are included. *Subject Heading:* **1. Teaching of oceanography.**—*I.S*

12M–7 551.46:37

Southern Regional Educational Board. Regional Committee on Marine Sciences, **Marin sciences programs in the South: preliminary report.** Comp. and ed. by Nelson Marshall Atlanta, Southern Regional Educ. Bd., **1954.** 103 p. map. **DLC**—This report is a guide to th research and teaching in oceanography carried on in the South. For each institution listed th type of research conducted is described, the research staff is listed and the research facilities ar itemized; for educational institutions also the teaching staff and courses of institutions are liste and the requirements for undergraduate and graduate degrees are spelled out. *Subject Headings* **1. Teaching of oceanography 2. Oceanographic research 3. Southern United States. I Marshall, Nelson** (*ed.*)—*I.L.D.*

12M–8 551.46:37

U. S. Congress. House. Committee on Science and Astronautics. **Education in the fiel of oceanography.** Hearing before the Subcommittee on Earth Sciences of the Committee o Science and Astronautics, U. S. House of Representative, Eighty-sixth Congress, First Session on H. R. 6298. August 25, **1959.** Washington, U. S. Govt. Print. Off., 1959. 37 p. 3 table **DLC** (GC31.U5)—Of special interest is the prepared statement by Gorden Riley in which h outlined the educational needs in the field of oceanography and in particular the financial difficultie that face a young student of oceanography. A report by the Committee on Oceanography of th National Academy of Sciences is included. This report examines the present status and pas history of the growth of basic and applied research in the marine sciences in the U. S. an analyzes some of the current problems of supporting oceanographic research. The statement made by Harry C. Kelly of NSF and Richard C. Vetter of NAS are pertinent. *Subject Headings:* **1. Oceanographic education 2. Marine science education 3. Government publication** —*I.S.*

HISTORY OF OCEANOGRAPHY

See also: **Development of oceanography** (Iselin), 12M–11; **Leningrad and national oceanography** (Preobrazhenskii), 12M–44; **Thompson's letters to Tizard** (Merriman) 12M–114.

12M–9 551.4

Montgomery, Raymond B. (*Chesapeake Bay Inst., Johns Hopkins Univ. Md.*), **Mappin ocean water.** *National Research Council, Wash., D. C., Publication,* No. 473:157–162, **195 DWB** (551.46 N277pr), **DLC** (GC57.N33, 1956)—The author points out that sources availab at this time are inadequate to meet present needs for a modern comprehensive work that describ the waters of the ocean. The need for more physical oceanographers is indicated. Methods mapping significant variables in the ocean require more attention than heretofore given. Descri tive oceanography requires greater emphasis and support. *Subject Headings:* **1. Descripti oceanography 2. Oceanographic Education.**—*E.Z.S.*

12M–10 551.46:06(0

Picotti, M., **Le développement de l'océanographie et ses progrēs dans le dernier dem siēcle.** [Development of oceanography and its progress in the last half century.] *Scienti* Bologna, 92(547):1–10, Nov. **1957. DLC.** Also issued in Italian as *Trieste. Istituto Spe mentale Talassografico, Pubblicazione,* No. 343, **1957. DWB, DLC**—A brief historical revie of oceanography beginning with the work of L. F. Marsigli who is said to have written the fir modern book on the subject, "Physical history of the Sea" (1725). Recent developments in met ods, procedures and instrumentation are described and their objectives outlined. The need f the studies of the International Geophysical Year is explained. *Subject Headings:* **1. Oceano raphy research progress 2. Oceanographic history.**—*E.Z.S.*

BIOGRAPHY

12M–11 551.46:92

Iselin, Columbus O'Donnell, **Matthew Fontaine Maury, 1806–1873, pathfinder of the seas: development of oceanography.** New York, Newcomen Society in North America, 1957. p. Illus. **DLC** (GC30.M418)—This leaflet gives a little information on the life and oceano- phic works of Maury, more about the development of oceanography in Europe and in the ited States since his day and considerable about the past, present and future work at Woods le Oceanographic Institute and elsewhere in the United States. The text comprises the New- nen address delivered at Falmouth on June 6, 1957 on the occasion of the 1957 Cape Cod grimage of the Newcomen Society in North America. A brief tribute to Iselin is given in introductory speech by Raymond Stevens, President of the Woods Hole Oceanographic Insti- ion Corporation. *Subject Headings:* **1. Biography of M. F. Maury 2. Development of eanography 3. Biography of C. O'D. Iselin 4. Woods Hole Oceanographic Institute Stevens, Raymond (Arthur D. Little Company, Cambridge, Massachusetts).**—*M.R.*

12M–12 551.5:551.46:92

Kuhlbrodt, E., **In memoriam Dr. H. C. Fritz Spiess Präsident der Deutschen Seewarte 4–1945.** [In memoriam Dr. H. C. Fritz Spiess, President of Deutsche Seewarte 1934–1945.] *tterlotse,* Hamburg, No. 147/148:137–140, June **1959. DWB**—A biographic sketch of Dr. itz Spiess, president of the Deutsche Seewarte (1934–1945) who died on Feb. 19, 1959 at age of 77 years. He began his career as a junior officer in 1905 in the hydrographic branch the German Imperial Navy. Dr. Spiess served as captain of the *Meteor* during the German antic Expedition in "1925–1927" which was organized and directed by Alfred Merz. Shortly er the start of the expedition Merz died and Spiess became the scientific director. Spiess was author of the popular scientific book "Die Meteorfahrt," Forschungen und Erlebnisse der eutschen Atlantischen Expedition" (1928), and of "Das Expeditions Schiff und Seine Reise" 31) and of a series of articles. *Subject Headings:* **1. Obituary of Fritz Spiess 2. Spiess, tz.**—*I.L.D.*

12M–13 551.46:92

†Plakhotnik, A. F., **Vydaiuschiĭsia russkiĭ istorik issledovaniia moreĭ A. P. Sokolov (k -letiiu so dnia smerti).** [100th anniversary of the death of A. P. Sokolov, the eminent ssian historian of marine research.] *Meteorologiia i Gidrologiia,* Leningrad, No. 8:24–27, g. 1958. photo. **DWB, DLC**—The contributions of A. P. Sokolov to the marine geography, drography and oceanography, and his role in the development of these sciences in Russia during 19th century, is considered. He studied the logbooks, reports and marine maps of numerous ssian expeditions during the 18th and early 19th centuries, in particular those for the northern far eastern seas and subsequently published hydrographic surveys of the Barents, Laptev, stern Siberian, Chukhotsk, Bering and Okhotsk seas; and also subsequently published the im- tant work "Severnaia Ekspeditsiia 1733–1743" (The Northern Expedition 1733–1743) in 1851. addition he also published compilations, such as "Taimyr Peninsula; reports on this area for past 100 years; description of the coasts of the Arctic Sea between the Oke and Oleneka vers by Lieutenant Kh. P. Laptov, et al, 1734–1742"; "Materials on the history of the hydrog- hy of the Gulf of Finland and the Baltic Sea," etc. He devoted considerable attention to dies on the history of the variations of the level of the Caspian Sea and the causes of this enomenon, the history of geographic discoveries and hydrographic investigations on the Caspian , wave force measurements in the open sea, marine currents, etc. *Subject Headings:* **1. Biog- hy of A. P. Sokolov 2. Sokolov, A. P.**—*I.L.D.*

BIBLIOGRAPHIES

See also: **Final Contract Report** (California) 12M–25; **Oceanographic Institution,** 1959 (Woods Hole), 12M–51; **Obtaining ecological data** (Hedgpeth), 12M–243; **Coastal investigations in U.S.S.R.** (Griesseier), 12M–367; **Committee on Oceanography** (Pan American Inst. Geog. and Hist.), 12M–626; **Carbonates and carbon dioxide** (Revelli), 12M–686.

12M–14 551.46:551.5:550.3:016

†Arctowski, Henryk Bronisław, **Bibliografia prac naukowych Henryka Arctowskiego.** ibliography of scientific works of Arctowski.] *Acta Geophysica Polonica,* Warsaw, 7(3/4): –295, 1959. 261 titles, 1894–1944. **DWB, DLC**—With his first publication in 1894, Arcto- ki began a career in the broad sphere of earth and atmosphere sciences. His bibliography list-

ing 261 professional scientific papers encompasses geology, geography, meteorology, climatol oceanography, glaciology and a variety of interrelated as well as tangential subjects. *Sub Headings:* **1. Bibliographical of Henryk Bronislaw Arctowski 2. Science bibliographies Henryk Bronislaw Arctowski.**—*E.Z.S.*

12M–15 551.46:025.45:

†International Association of Physical Oceanography, Rome, 1954, **Report of Committee Questions Concerning Preparation of a Bibliography.** H. U. Sverdrup, chairman. *Procès-Verbaux,* pub. Bergen, **1954.** p. 101. **DWB**—Contains decisions of the Committee c cerning: a) Bibliography—inclusion of the "Bulletin Analytique, Section 2, Physique du Glo and "Science Abstracts" and the list of any physical oceanographical paper, and a recommenda that authors should send copies of their papers with abstracts to above mentioned abstrac journals: the communication of the above recommendation to the general Secretary of the Asso tion; and suggestions on the organization of an abstracting organ for the I.U.G.G.; b) classifica —the reappointment of the Committee for a 3 year period with the proviso that its task be lim to preparing a classification scheme for physical oceanographical literature within the framew of the Universal Decimal Classification system. *Subject Headings:* **1. Oceanography bibli raphies 2. U.D.C. for Oceanograph. I. Sverdrup, H. U.**—*A.M.P.*

12M–16 551.46:016(

†Japanese National Commission for UNESCO, **Oceanographic papers in Japan: annota bibliography, 1939–1957.** Pub. March **1958.** 217 p. 1560 items in chronological arrangem Author index. **DWB**—This is a continuation of the previously published (1957) bibliograph the same title which included the period 1873–1938 (*see* 9E-140, May 1958, *Met. Abstra* whereas the present issue contains similar subject material for 1939–1957, listed in the same as the previous bibliography. *Subject Headings:* **1. Oceanography bibliographies 2. Japa** *W.N.*

12M–17 551.46:061

†Lacombe, Henri, **Rapport de la Section d'Océanographie Physique.** [Report of the tion of Physical Oceanography.] *Comité National Français de Géodésie et de Géophysi Comptes Rendus,* 1957:135–159, pub. **1958.** Bibl. p. 144–159. **DWB**—The greater part of activity of the section of physical oceanography during the year 1957 has been devoted to work carried out in compliance with the program of the International Geophysical Year. An the other work, one should point out those relating to: the physical properties of sea-wa bathymetry; morphology and regime of coasts; the ocean circulation; the tides, tidal waves, wa swells, and biology. An important bibliography gives the list of the principal works publi in France in the course of the year 1957, and provides evidence of the great activity of the Fr in the scope of physical oceanography. *Subject Headings:* **1. Physical oceanography 2. O nography bibliographies 3. France.**—*A.V.*

12M–18 551.46(52)

†**List of oceanographical works made in the meteorological offices of Japan after World War II (1945–50).** *Japan. Central Meteorological Observatory. Tokyo. Oceanogra cal Report,* 2(2):207–217, Dec.**1951.** All refs. **DWB**—Unannotated list of references wi few titles in English but all serial entries in Japanese. *Subject Headings:* **1. Bibliogra 2. Oceanography bibliographies 3. Japanese works.**—

12M–19 551.46(

†National Oceanographic Council, **Annual Report, 1957/1958; 1958/1959.** Cambridge, versity Press, **1958; 1959.** 39 p. and 41 p. List of published papers and reviews, p. 36–39; 41. Review in *Nature,* 183(4671):1305–1306, May 9, 1959. **DWB**—This is an organizat progress report on the personnel, finances, and facilities including the R.R.S. 'Discovery II' o National Institute of Oceanography. A brief summary of the progress made in marine physics marine biology is included. Their publications, lectures and other activities are described. A of pertinent published papers and reviews is appended. *Subject Headings:* **1. Oceanogr progress reports 2. Marine physics 3. Marine biology 4. Oceanography bibliographi** *E.Z.S.*

12M–20 551.46

†Texas. Agricultural and Mechanical College. Dept. of Oceanography and Meteoro **Contributions in Oceanography and Meteorology, Vol. 3, No. 60–89, 1955–1957.** Is **1958.** 446 p. figs., tables, refs., bibliogs., eqs. **DWB**—For listing of pertinent articles from

see Pt. III, p. 1058, July 1955, *Met Abstracts.* For contents of Vol. 2, *see* Pt. III, p. 232, eb. 1958. For contents of Vol. 3, *see* Pt. III, p. 482, March 1959. For abstract on Vol. 1, *e* 6.10-1, Oct. 1955; Vol. 2, *see* 9F-87, June 1958, *MAB. Subject Heading:* **1. Oceanography print collections.**

12M–21 551.5:551.46:016

†*Texas. Agricultural and Mechanical College. Dept. of Oceanography and Meteorology,* **ceanography and meteorology of the Gulf of Mexico, Annual Report,** May 1, 1957–April), 1958. May 1, **1958.** 9 p. 4 figs. List of publications under the contract during the period, 6–7. **DWB**—A list of papers published between May 1957 and May 1958 by the Department Oceanography and Meteorology, Texas A&M College. The project of the study of oceanogphy and meteorology of the Gulf of Mexico began on June 15, 1950 soon after the formation the Department. Among the many subjects treated are the following: the net weekly variaon of surface temperature; the classifications of hurricanes by storm tide and wave energy indices. *ubject Headings:* **1. Oceanography bibliographies 2. Meteorology bibliographies 3. Gulf Mexico. I. McLellan, Hugh J.**—*N.N.*

INSTITUTIONS, OBSERVATORIES, STATIONS, SERVICES, PROGRESS REPORTS

See also: **Oceanographic Institute of the Academy of Sciences of the U.S.S.R.** (Bruevich) 12M–669; **Arctic Ocean research** (Cotell), 12M–1077.

12M–22 551.46:061.1(47)

Badogom, K. S., **O zhelatel'nom napravlenii rabot Instituta okeanologii AN SSSR na oriakh Dal'nego Vostoka.** [Desirable orientation of the work of the Oceanographic Institute the Academy of Sciences of the U.S.S.R. in the Far Eastern seas.] *Akademiia Nauk SSSR. keanograficheskaia Komissiia, Trudy,* 3:13–19, **1958. DLC** (GC1.A47A2)—The problems which e Oceanographic Institute of the Akademiia Nauk of the U.S.S.R. could help solve for various terests in the Far Eastern waters (N.W. Pacific) are discussed at some length. 1) An atlas currents in the bordering seas and gulfs; 2) Ice navigation charts taking into account the drometeorological factors for protection of winter commerce in the Okhotsk Sea and adjacent lfs or straits; 3) a manual for ice forecasting for this area; 4) a manual for storm warning recasts; 5) pilot charts for Bering and Okhotsk Seas giving weather, ice and sailing conditions routes; 6) coastal morphology studies; 7) wave forecast studies and finally studies to aid in eventing deterioration of materials in the marine areas by wind, weather and salt, etc. *Subject eadings:* **1. Oceanographic research proposals 2. Oceanographic research in Far Eastern J.S.S.R.) waters 3. Far East.**—*M.R.*

12M–23 551.579:061.1(47):551.464

Blinov, L. K., **Razvitie moskikh gidrokhimicheskikh issledovaniĭ v sisteme Gidrometeologicheskoĭ sluzhby SSSR.** [Development of marine hydrochemical research in the Hydroteorological Service of the USSR.] *Meteorologiia i Gidrologiia,* Leningrad, No. 4:34–35, oril **1959. DWB, DLC**—The various marine hydrochemical investigations that must be initiated d expanded as proposed by the council of State Oceanographic Institute are summarized. These clude the physical chemistry of sea water, dynamics of biologically active substances, gaseous uilibrium between sea and atmosphere, dynamics of formation of water masses, migration of h, effect of water on port structures, hydrochemical investigations in the Black, Azov, Caspian d Aral Seas; mixing of river and sea water at river estuary stations; radioactive and isotope mposition of sea water; daily, seasonal and secular variations of hydrochemical processes, etc. e Central Directorate of the Hydrometeorological Service issued an order on May 16, 1958: Concerning the development of marine hydrochemical investigations within the hydrometeorological rvice" which provided beginning with 1959 the necessary means for equipping laboratories in servatories and on vessels of the Principle Directorate of the Hydrometeorological Service. e plan of hydrochemical research, marine research by the Hydrometeorological Service and its ection by the State Oceanographic Institute in the coming years is outlined. *Subject Headings:* **Hydrological services 2. Marine hydrochemical research 3. Soviet hydrometeorological rvice 4. U.S.S.R.**—*I.L.D.*

12M–24 557.46:061.3

Brown, Harrison and Vetter, Richard (*both, Natl. Academy of Sciences, Nat. Res. Council, ash, D. C.*), **A national oceanographic program.** *American Geophysical Union, Transactions,* (4):323–330, Dec. **1959. DWB, DLC**—The Committee on Oceanography released a summary of its suggestion in Feb. 1959. The first chapter contains the general recommendations an series of specific recommendations on education, manpower, and new ships, etc. The goal of report was to construct a framework within which a vigorous, healthy, imaginative national gram in the marine sciences can grow. Public interest and reaction far exceed the expectati The Special Committee on Oceanography appointed by the Federal Council on Science and T nology is primarily responsible for budgeting and for carrying out the program. *Subject He ings:* **1. Oceanography programs 2. Marine sciences programs.**—*E.K.*

12M–25 551.46(265/2

California. Univ. Scripps Institution of Oceanography, **Final Report on Contract No 233(04), Oct. 28, 1959.** 39 p. p. 3–28, "Contributions, many with abstracts, that have arisen of research supported under this contract." **DWB** (M26.6 C153se)—Research objectives topics completed during June 30, 1951 to March 15, 1958 under Contract Nonr-233(04) to port research of oceanography of the Pacific and the major expeditions of the Scripps Institu which took place at the same period are listed. The contributions are listed in the sequenc which they appear in the series contributions. A new series, that is essentially chronolog from 565 to 1023 provide a complete bibliographical reference. The duplicated technical rep with addresses and number of copies, revised July 1959, are listed. *Subject Headings:* **1. Ocea graphic research institutes 2. Oceanography bibliographies. I. Contract Nonr-233 II. Revelle, Roger.**—*K.C.*

12M–26 551.46:061.1

Canadian Oceanographic Institute. *Science,* Wash., D. C., 130(3374):490–491, Aug. **1959. DLC**—The Institute, to be known as the Bedford Institute of Oceanography, will be u the Department of Mines and Technical Surveys and will take 5 years to complete. A staf some 300 oceanographers, hydrographers, submarine geologists, and other scientific personnel, supporting staff, and an operating fleet of new oceanographic vessels is anticipated. The inst will study the physical characteristics of the waters and underlying sea bed of Canada's Atla and Sub-Arctic coasts; it will house the regional office of the Geological Survey of Canada. Atlantic and Sub-Arctic sections of the Canadian Hydrographic Service will be expanded. *ject Headings:* **1. Oceanographic institutes 2. Canadian Oceanographic Institute.**—*I.S.*

12M–27 551.46:061.1(42

Deacon, G. E. R., **British studies in oceanography.** *Impulse,* (England), No. 4, 1–8, M **1958.** pictures. **DLC.** Reprinted as *National Institute of Oceanography, Wormley, Su England, Collected Reprints,* 6(235), Dec. **1958. DWB**—A survey of oceanographic studies b carried out by the British. One of the many aspects of the work at the National Institut Oceanography is the study of waves and currents. Methods have been evolved whereby separate estimation of sea and swell can be done by machine. These have improved the met of prediction based on meteorological data. The existence of a layer of no horizontal motion a deep countercurrent was proved. The ocean has a strong thermal current which must be t into account along with the effect of wind in current-formation. The float method of measu and tracing depth currents devised by J. C. Swallow is described. *Subject Headings:* **1. Oce graphic institutions 2. National Institute of Oceanography 3. Surrey, England.**—*E*

12M–28 551.501.9:525.6:551.46

Doodson, A. T., **The Liverpool Observatory and Tidal Institute.** *Repr. from: Live Trade Review,* **1955.** 7 p. 2 figs. Liverpool Observatory was transferred to Bidsto 1867 to give ships a time service, but gradually changed to tidal research; meteorological obs tions are also made. The Doodson-Lege tide-predicting machine is described and illustr Storm surges are also investigated. Shorter version without illustrations appears in *Ll Calendar,* pub. London, 1955. *Subject Headings:* **1. Liverpool Observatory 2. Tide fore ing.**—*C.E.P.B.*

12M–29 551.46:06.45

Expansion of marine research in the United States. *Nature,* London, 183(4667):1 1006, April 11, **1959. DWB**—This commentary on conclusions and recommendations by the mittee established under the National Academy of Sciences-National Research Council rev U. S. progress and needs of marine sciences. It clearly shows that oceanography ranks in portance with exploration of space. The ten-year plan involving 651 million dollars in exce the proposed expenditures is described as minimal. Qualified research workers will be in de *Subject Headings:* **1. Oceanographic programs 2. United States.**—*W.N.*

12M–30 551.46:061.1(759)

†Florida. State Univ., Tallahassee, **The Oceanographic Institute, 1957/1958. (1957).** 16 p. photos. "Some recent contributions from the Oceanographic Institute," p. 16. **DWB**—A descriptive and illustrative pamphlet on the new Oceanographic Institute at Florida State University, its purpose, staff and facilities on campus and at the Marine Laboratory at Alligator Harbor 43 mi south of Tallahassee. It has 4 main objectives: (1) education facilities for research by staff members, (2) graduate students and exchange or visiting research workers, (3) basic investigation on local marine problems, (4) applied research on utilization of marine resources of Florida. Program and research activities are outlined, the summer school course, etc. are described. A list of recent contributions is appended. *Subject Headings:* **1. Oceanographic institutes 2. Florida. State University. Oceanographic Institute 3. Tallahassee, Fla. 4. Alligator Harbor, Fla.**—*M.R.*

12M–31 551.46:06

Hidaka, Koji, **General survey of the post-war activities in physical oceanography.** *Journal of Geography,* Tokyo, 58(6/7):195–198, **1949.** In Japanese; English summary p. 198. **DLC** (Orientalia)—The post-war (II) activities in physical oceanography throughout the world are reviewed in this paper. The subjects treated are theoretical research in dynamical oceanography, especially the great advances achieved with respect to the understanding of the problem of lateral mixing in the ocean. The research also was concerned with wind waves and swell, heat transfer between the ocean and the atmosphere, and tidal theories, etc. *Subject Heading:* **1. Physical oceanography.**—*K.C.*

12M–32 551.46(52)

Hidaka, Koji and Yoshida, Kozo (*Geophysical Inst., Faculty of Science, Tokyo Univ.*), **Physical oceanography in Japan in the period 1953–55.** Tokyo, Science Council of Japan, **1955.** 23 p. At the head of title: International Association of Physical Oceanography, Tokyo Assembly, October, 1955. **DLC** (GC57.H5) Also issued as: *Tokyo. Univ. Geophysical Institute, Geophysical Notes,* 11(2), 1958 contribution 16. **DLC.** Also issued in: UNESCO Symposium on Physical Oceanography, Tokyo, Oct. 1955, **Proceedings,** pub. 1957, p. 184–196. French summary, p. 184. **DWB**—Among the activities reported are studies on waves, tides, oceanic circulation variations, upswelling, sea ice, and oceanographic cruises (and observational data) by Japanese Government, University and institutional agencies or individuals. This report supplements that for 1951–54 by K. HIDAKA (*see* 7.6–41, June **1956.**) *Subject Headings:* **1. Oceanographic research 2. Japanese oceanographic investigations 3. Japan.**—*M.R.*

12M–33 551.46(52)

Hidaka, Koji and Yoshida, Kozo (*both, Geophysical Inst., Tokyo Univ.*), **Physical oceanography in Japan in the period 1954–1957.** Tokyo, Science Council of Japan, **1957.** 25 p. At head of cover-page: International Association of Physical Oceanography, Toronto, Sept. 1957. **DWB**—This is a summary of Japanese activities within the various fields of physical oceanography 1954–57. Some results obtained, along with instruments developed at universities, organizations and by individuals are discussed. This report supplements part of previous report for 1951–1954 by K. Hidaka (*see* 7.6–41 June 1956) and report for 1953–1955 which appears separately in this issue (*see* 12M–32). *Subject Headings:* **1. Oceanographic research 2. Oceanographic instruments. 3. Japan**—*W.N.*

12M–34 551.46:06(47)

Iushchak, A. A. and Muromtsev, A. M., **Uspekhi sovetskoĭ okeanografii.** [Progress of Soviet oceanography.] *Meteorologiia i Gidrologiia,* Leningrad, 11:60–67, **1957. DWB, DLC**—After the October Revolution oceanography developed in connection with the growth of the Soviet economy. The establishment and growth of research institutes engaged in both theoretical and applied oceanography is summarized and the names of the various institutions and their activities in oceanographic investigations are cited. At present the USSR has about 20 special scientific research vessels, more than 30 massive research institutes and some 500 marine hydrometeorological stations. In connection with fishing and whaling activities regular hydrometeorological and biological investigations are being carried out in the Antarctic Ocean and in connection with the IGY inter-disciplinary expeditions are operating in Antarctica. The instrumentation developed to make observations on waves and currents is described briefly. The type of oceanographic data being collected, their presentation and publications are described. The titles of various studies on theoretical, chemical, geological oceanography and of handbooks are tested and discussed. Among the various problems investigated the authors consider the research on wind waves; oceanic circulation; ebb and flood tide; effect of wind and bottom relief upon currents; the relation betwee gradient pressure and rise and fall of sea level; fluctuation of the surface level of the Caspia Sea; mixing of oceanic and sea waters; the factors determining the extent, distribution and move ment of ice in the Arctic Ocean; salt balance of the seas and oceans; hydrology of the Black Sea Sea of Azor and of the Baltic Sea; the water regimes of open oceanic waters, etc. The mor significant studies are briefly described, and the names of the more important investigations ar cited. *Subject Headings:* 1. **Soviet oceanography** 2. **Progress in oceanography** 3. **U.S.S.R.**— *I.L.D.*

12M–35 551.46:0

Janiszewski, F., **Sukcesy radzieckiej oceanologii.** [Soviet successes in oceanography. *Przegląd Meteorologiszny i Hydrologiczny*, Warsaw, 7(3/4):192–195, **1954.** 2 refs. **DLC, DW** —A description of methods and preliminary results of oceanographic investigations carried out o board the "Vitiaz" in the Pacific Ocean. The studies deal mainly with ocean bottom and change occurring in the sea fauna with the increase of sea depth. The samples of ocean bottom wer taken with the aid of a special hydrostatic sonde devised by Sysoiev and Kusinov, scientifi workers of the Institute of Oceanography of the Academy of Sciences USSR. The ship i equipped with 14 laboratories. The hydrostatic sonde enabled one to take in 1950 a 33.50 r sample from a depth of 3880 m which showed a cross section of sediments for a period of abou 7 million years. *Subject Headings:* 1. **Oceanographic research** 2. **Hydrostatic sondes** 3 **Marine sediments** 4. **U.S.S.R.** 5. **Pacific Ocean.**—*A.M.P.*

12M–36 551.46(09):551.46:378.9(47

Kort, V. G. and Suetov, S. V., **Ocherk istorii organizatsii i razvitiia instituta okeanolog Akademii Nauk SSSR.** [Outline of the history of the organization and development of th Institute of Oceanography of the Academy of Sciences of the U.S.S.R.] *Akademiia Nauk SSS Izvestiia, Ser. Geog.*, No. 5:119–123, May **1957.** **DWB**—A laboratory of oceanography was estab lished in 1941 within the system of the Academy of Sciences, its directors were P. P. Shizsho and V. B. Bogozov. In 1946 it was transformed into the Institute of Oceanography of th Academy of Sciences of the USSR. At the end of 1948 it received its first vessel, the "Vitiaz. The institute is divided into the following sections: physical oceanography, chemical oceanograph laboratory of marine deposits, plankton laboratory, and benthos laboratory. The institute als contains a bacteriology laboratory and a Caspian section for studying the water regime of th Caspian Sea. There are also a department of marine technology and a nekton laboratory. Tw experimental stations were established in the Black and Caspian Seas. Besides the Vitiaz th institute has three other vessels. The first marine Antarctic expedition was directed by V. G. Koz in 1955–1956 with the aid of the "Ob." The scientific attainments of the Institute of Oceanog raphy are summarized briefly. These include hydrological structure, and characteristics of th water masses of the northeast Pacific and Far Eastern waters; charts of tidal currents for th Kuriles Straits, the role of the Kuriles Straits in the formation of the water masses of th northeast Pacific; water exchange in the Indian sector of the Antarctic waters; theory of equa torial counter currents in the ocean (V. B. Shtokman); method of complete currents for studyin the total water transport in a baroclinic ocean of real boundaries (V. B. Shtokman); simplifie methods for computing wind currents in seas of moderate depth regardless of relief (V. Shtokman and K. N. Fedorov); chemical "landscapes" and chemical processes, migration chemical elements; marine deposits in the northwest Pacific, Antarctica and Indian Oceans; studie on marine biology, etc. *Subject Headings:* 1. **Oceanographic institutions** 2. **Soviet oceanog raphy** 3. **Institute of Oceanography** 4. **U.S.S.R.**—*I.L.D.*

12M–37 551.46:06(268

Laktionov, A. F. (*Inst. Arctique de Léningrad*), **Les recherches océanographiques dan l'Arctique Central.** [Oceanographic research in the Central Arctic.] *France. Comité Centr d'Océanographie et d'Etudes des Côtes, Cahiers Océanographiques*, 11(10):715–725, Dec. **195** 9 figs., 18 refs. **DLC, DWB**—An illustrated paper summing up the Soviet research accomplish ments in the Central Arctic in the field of oceanography. From 1937 to 1958 the U.S.S.R. ha had 8 drifting stations of which 2 were in operation simultaneously in 1954 and as many as thr in 1955–56. Also in operation were 250 hydrobiological stations, studying more than 800 sample The accomplishments list more than 50,000 observations on currents, more than 10,000 isolate soundings, establishment of more than 700 deep hydrological stations and the simultaneous observ tions of temperature and salinity therefrom, and also establishment of more than 250 hydrobi logical stations. *Subject Headings:* 1. **Oceanographic research** 2. **Soviet oceanographic r search** 3. **U.S.S.R.**—*I.S.*

12M–38 551.5:551.46(263)

Leipper, Dale F., **Oceanography and A. & M.** *Commentator,* Fall 1958. p. 63–66. Re-
inted as *Texas. A. & M. College. Dept. of Oceanography and Meteorology. Contributions in*
ceanography and Meteorology, 5(125/153):143–147, **1958/1960,** issued **1960. DWB, DLC**—
n introduction to oceanography is presented. Problems of oceanography arising from the effects
the Gulf of Mexico on Texas, and related problems of meteorology are enumerated. The need
r a scientific approach to these problems became evident in 1947 by recognizing the relations
tween the high mortality rate of oysters and off-shore petroleum operations and these stimu-
ted activities at Texas A. & M. College. Using scientists from the Texas A. & M. campus
self, a department of oceanography was established in 1949. Meteorology at Texas A. & M.
d its origin in 1917 with the training of a large group of meteorologists on the campus, spon-
red by the Army Signal Corps. The department now has a full oceanographic program handled
intly with meteorology. *Subject Headings:* **1. Marine meteorology 2. Texas. A. & M. Dept.**
Oceanography 3. Gulf of Mexico—*O.T.*

12M–39 551.46:061.6(73)

Magat, Richard, (*Science Service Correspondent*), **Scientists go to sea.** *Science News*
tter, Wash., D. C., 70(11):170–171, Sept. 15, **1956.** photo. **DWB, DLC**—This article reports
the increased tempo of activity by scientists at sea this summer. It notes some of the activities
U. S. oceanographic institutes and explained the nature of some of the studies being made.
e prediction of ocean waves, shore protection, and hurricane research are among the problems
plained. Some of the scientific, economic and military applications of these studies are indicated.
bject Headings: **1. Oceanography research 2. United States.**—*E.Z.S.*

12M–40 551.46:06(540)

Nanda, J. N. (*NHQ, New Delhi, India*), **Physical oceanography in India.** (In: UNESCO
mposium on Physical Oceanography, Tokyo, Oct. 1955, **Proceedings,** pub. **1957.** p. 179–181.
ench summary, p. 179) **DWB**—This is a brief progress report. Andhra University has been
ing coastal oceanographic work since 1952. Plans are under way for increased studies in the
ld. Meteorological and tidal studies were given more emphasis than oceanography in the past.
bject Headings: **1. Oceanography progress report 2. Andhra, India.**—*E.Z.S.*

12M–41 551.46:06.045

Ovey, Cameron D., **Joint Commission on Oceanography** (Report of meeting held at Monaco,
–25 September, 1952). *International Union of Geodesy and Geophysics, Bulletin d'Information*
2):373–377, April **1953. DWB**—Report of meeting, members present, resolutions, etc. Mostly
aling with sea research. *Subject Headings:* **1. I.U.G.G. Joint Commission on Oceanography**
Oceanography research.—*M.R.*

12M–42 551.46:06(593)

Penyapol, A. (*Hydrographic Dept., Royal Thai Navy, Bangkok*), **Development of oceano-**
aphic work in Thailand. (In: UNESCO Symposium on Physical Oceanography, Tokyo, Oct.
55, **Proceedings,** pub. **1957.** p. 182–183. French summary p. 182.) **DWB**—A brief prog-
ss report. Tidal studies, coastal studies, and meteorological studies were previously emphasized,
wever, strong interest has been expressed and plans for additional oceanographic research have
en made. *Subject Headings:* **1. Oceanography progress report** 2. **Thailand.**—*E.Z.S.*

12M–43 551.463/4

Picotti, Mario, **Relazioni talassografiche presentate all' Associazione d'Oceanografia**
sica, Roma 1954. [Oceanographical reports presented to the International Association of
ysical Oceanography.] *Trieste. Istituto Sperimentale Talassografico, Pubblicazioni,* No. 313,
55. (8) p. Reprinted from *International Association of Physical Oceanography, Rome 1954,*
ocès-verbaux, No. 6. **DWB, DLC**—A note on the achievements between 1952 and 1954 and
ivities between 1951 and 1954. Explanation of units of measurements used in physico-chemical
earch. *Subject Heading:* **1. Oceanography reports.**—*E.Z.S.*

12M–44 91.04(98):551.46(268)

Preobrazhenskii, Iu. V. and Evenov, N. I., **Leningrad i otechestvennaia okeanografiia**
mesto vvedeniia). [Leningrad and national oceanography (in lieu of an introduction).]
scow. Gosudarstvennyĭ Okeanograficheskiĭ Institut, Trudy, No. 41:3–8, **1957. DLC**—The
roduction to oceanography and studies of the Arctic expeditions are briefly outlined with the
iew of various activities on these subjects in St. Petersburg (later Leningrad) from the early
h century up to 1956. The review gives an account of time, persons, places and purposes

of activities. Marine studies began in the Gulf of Finland and included expeditions to Kamcha
and Bering Strait, then extended to studies of North Arctic seas, the Northern Passage arou
Siberian coast etc. The formation of new scientific research organizations, development of spe
oceanographic instruments, and methods of research and recording are also included in this revi
Further intensive studies and large scale expeditions, conducted after the revolution, are bri
described and basic data given. *Subject Headings:* **1. History of oceanography 2. Ar
expeditions 3. U.S.S.R.**—*N.P.S.*

12M–45 551.46:06(5

Qureshi, M. Rahimullah (*Central Fisheries Dep., Karachi, Pakistan*), **Oceanography
Pakistan.** (In: UNESCO Symposium on Physical Oceanography, Tokyo, Oct. 1955, **Proce
ings**, pub. **1957.** p. 207–213. French summary p. 207.) **DWB**—A brief report on the
parts of Pakistan, their climate and physiography. Until recently only submarine canyons h
received considerable attention but the newly formed government plans to expand their resea
facilities. Previous work under the aegis of the British emphasized meteorological and t
studies. *Subject Headings:* **1. Climate of Pakistan 2. Physiography of Pakistan 3. O
nography research programs 4. Pakistan.**—*E.Z.S.*

12M–46 551.46(265/2

Revelle, Roger (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Deep-sea research as a coop
tive enterprise.** *National Research Council, Wash., D. C., Publication,* No. 473:163–171, 1
eqs. **DWB** (551.46 N277pr), **DLC** (GC57.N33, 1956)—A discussion of several oceanogra
problems and the achievements recently made by the Japanese-American oceanographers' exp
tions that surveyed the Pacific north of 20 degrees, an area larger than the continents of N
and South America. Meteorological observations are considered more advanced and much m
successful than those in oceanography because of greater physical obstacles encountered in ma
oceanographic observations. *Subject Headings:* **1. Deep sea research 2. North Pacific.**—*N*

12M–47 551.46

Shuleĭkin, V. V., **Sovetskaia fizika moria za sorok let.** [Forty years of Soviet ph
of the sea.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofizich.*, No. 11:1366–1383, Nov. 1
13 figs., 35 refs. Transl. into English in the corresponding number of the *Bulletin of the Aca
of Sciences, USSR Geophysics Series.* **DLC**—In this review of the progress of researc
physical oceanography in the Soviet Union the author discusses in considerable detail the re
of studies on the heat balance of ocean and sea water areas, heat transport by horizontal curr
the characteristics of the atmosphere and stratosphere over the oceans, the thermobaric stan
waves or seiches, the dynamics of ocean currents, the theory of wind, gradient and convection
rents, theory of tides, underwater earthquakes, hydrooptic studies including penetration and
tering of light in water, etc. The more important studies are mentioned and the results
summarized. *Subject Headings:* **1. Physical oceanography 2. Soviet oceanography.**—*I.*

12M–48 551.461:6

Stroup, E. Dixon and Austin, Thomas S., **Review of the oceanographic programs of
Pacific Oceanic Fishery Investigations.** *American Geophysical Union, Transactions,* 36
881–884, Oct. **1955.** 3 figs., 10 refs. **DWB, DLC**—The Pacific Oceanic Fishery Investiga
(POFI), U. S. Fish and Wildlife Service, has, since early 1950, been engaged in oceanogr
surveys of the tropical and subtropical central Pacific, and since last year the northern temp
central Pacific. These studies support POFI's exploratory fishing program, stressing the loc
of areas of enrichment and increased productivity in the upper layers. The tabulated data
the cruises, together with vertical sections of the measured fields and brief descriptive texts
published as Special Scientific Reports of the U. S. Fish and Wildlife Service. In the tr
central Pacific, standard oceanographic work is nearing completion, with reports publishe
seven cruises crossing and defining the equatorial current system (lat. 15°N–10°S, long. 14
180°). Similar reports on seven cruises in Hawaiian Islands offshore waters and three c
to temperate waters north of Hawaii (lat. 25°N–40°N, long. 140°–170°E) are in prepar
Plans for 1955 include a reconnaissance oceanographic cruise to the equatorial eastern Pa
cooperation with Scripps Institution of Oceanography and the Peruvian Hydrographic Office
participation in NORPAC, a joint survey of the entire Pacific north of 25°N latitude d
July, Aug., and Sept. by POFI, SIO, the State of California, University of Washington, P
Oceanic Group of Canada, and Japanese agencies. *Subject Headings:* **1. Oceanography
grams 2. Fisheries 3. Pacific Oceanic Fishery Investigations 4. Pacific Ocean.**—*Au
abstract.*

12M–49 557.462:061.3

The 83rd Colloquim of the French National Centre of Scientific Research (Topography and ecology of oceanic deeps) held at Nice, May 5–14, 1958. *Geophysical Journal,* 1(4):352–355, Dec. 1958. 2 refs. **DWB, DLC**—Representatives from Norway, Sweden, Denmark, Holland, U. S., Italy, Spain, North Africa and Great Britain participated in this meeting. The western Mediterranean basin was the subject of discussion. Another interesting subject of discussion was the topography of the oceanic deeps. Papers were also read on marine sediments. Two of the three directors of the International Hydrographic Bureau presented papers during an afternoon visit—Director VIGLIERI described the progress of the revision of Monaco Hydrographic maps. Director DAMIANI discussed the present state of agreement on the subject of nomenclature of ocean bottom features. The colloquim closed with the official inauguration of the Oceanographic station at Villefranche-sur-Mer. *Subject Headings:* **1. Oceanographic conferences 2. Villefranche-sur-Mer, Mediterranean Sea.**—*I.S.*

12M–50 551.46:06.045(75)

U. S. Congress. House. Committee on Merchant Marine and Fisheries, **Oceanography in the United States.** Hearings before the Special Subcommittee on Oceanography of the Committee . . . 86th Congress, 1st Session. Wash., D. C., Govt. Print. Off., **1959.** 394 p. figs., tables. **DWB** (551.46072 U581oc)—A report on the hearings before the Subcommittee on Oceanography. Statements of various people are quoted. Among the important statements were those made by: 1) GORDON LILL, Head of Geophysics branch of Naval Research, 2) JOANNE MALKUS, meteorologist, 3) BOSTWICK KETCHUM, senior oceanographer, Woods Hole, 4) JOHN LYMAN, Division of Oceanography, U. S. Navy. The purpose of the hearing was to consider the problems relating to oceanography in the light of new concepts of transportation, military needs and exploitation of food resources. *Subject Headings:* **1. Hearings on oceanography 2. Military oceanography 3. Transportation problems in oceanography 4. Oceanic resources.**—*A.H.K.*

12M–51 551.46:061.1(73)

†Woods Hole, Mass., **Oceanographic Institution, Annual Report, 1959.** Issued **1960.** 63 p. figs., photos. List of 63 papers issued as Publications during **1959**, p. 52–55. **DWB** (551.4606 W894r)—Reported among the Institution's highlights of 1959 are the performances of its two research ships, the Chain and the Atlantic. The latter to be replaced by a modern ship designed specifically for oceanographic research. A map shows oceanographic positions and tracks of the five cruises for bathythermograph observations made this year. Observations from the Chain on physical oceanography include conditions in the northern Sargasso Sea, showing the thermocline at a number of stations and the temperatures of the upper layers. The explanation of an almost absolute absence of slope water in the section of the North Atlantic surveyed by the Crawford, needs further analysis before attributing it to seasonal occurrence. The observations on sea surface waves by an instrumented tower in Buzzards Bay is described. Methods and results of measurements of currents, tidal influence on temperature of floats, deep currents and surface currents, meandering and pulsations of the Gulf Stream were some other highlights referred to. The topics and results of an eight weeks course of theoretical studies in geophysical field dynamics are explained. Modification of air masses over the ocean, sea-salt nuclei, bursting of air bubbles at the sea surface, an extensive analysis of heat balance in the tropics and major cloud towers were aspects of marine meteorology discussed. Investigations on sound scattering, studies of the ocean as a medium for the transmission of sound, measurements of the sound velocity of sea water were also carried out by means of improved instruments and partly by observations in local waters. Improvement of the resolution of echo-sounders, the use of seismic reflection and refraction techniques, and technical improvements in the recorders contributed to the manifold results of bathymetric research. All these reports as well as those on chemistry, marine biology, instrumentation and fleet operations are illustrated by photographs, the latter is also supplemented by a cruise diary. A bibliography of 63 publications in addition to an Author, Subject-Locality, and Taxonomic Index are included. *Subject Headings:* **1. Annual oceanographic reports 2. Oceanography bibliographies.**—*O.T.*

CONFERENCES, SYMPOSIA AND MEETINGS

IGY PROGRAMS

See also: **Ships International Geophysical Year (Shigy) 12M–605.**

12M–52 551.506.22:551.46:061.3(45)

Aliverti, G., **I lavori talassografici in Italia durante l'Anno Geofisico Internazionale 1957–58.** [Oceanographic work in Italy during the IGY 1957–58.] *Associazione Geofisica Italiana,* *8th, Rome, Feb. 12–14, 1957, Atti,* pub. Rome, **(1959).** p. 41–45. 3 figs., Italian and Engli summaries p. 45. **DWB**—An account is given of the work accomplished in Italy, in relation oceanography during the IGY, 1957–58, and of those still in progress for the IGC, 1959. T work was scheduled by the Commissione Nazionale Italiana per l'A.G.I. of the C.N.R. *Subj Headings:* **1. IGY programs 2. Oceanographic programs 3. Italy.**—*Author's abstract.*

12M–53 551.46:551.506.22:06

Deacon, George Edward Raven, **Oceanography in the International Geophysical Ye** *International Union of Geodesy and Geophysics, Bulletin d' Information,* No. 16:514–548, D **1956.** 9 refs. **DLC.** Reprinted in *National Institute of Oceanography, Wormley, Englan Collected Reprints,* Vol. 5, **1957,** No. 199. Also his **International Geophysical Year: charti the waves and currents.** *The Scotsman,* Edinburgh, July 1, **1957.** Reprint of 2 pages issu as *National Institute of Oceanography, Wormley, England, Collected Reprints,* Vol 5, **1957,** N 208.—Although the initiative for the International Geophysical Year came from scientists who a primarily interested in meteorology, geomagnetism, geoelectricity and ionospheric physics, a from a wider circle interested in Antarctic exploration, it soon became evident that the progra would not be complete without simultaneous measurements and studies of the oceans. Interacti between the sea and the atmosphere plays a major part in atmospheric as well as oceanic circu tion, so that the physics of the air and oceans and their general circulations have much in comm There is also evidence that there are sea-level disturbances coupled with barometric and magne phenomena in the atmosphere, and the background of electric-current fields in the oceans n used to study water movement, depends on events in the upper atmosphere. The Internatio Association of Physical Oceanography, one of the constituent association of the Union of Geod and Geophysics, appointed a small committee to make recommendations, which were accepted w little modification by the International Geophysical Year Committee. The main plans are obtain an understanding of sea-level changes of both long and short periods and their relationsh to other phenomena in the ocean and atmosphere, and to learn more about the water moveme in the oceans, both at great depths and near the surface. *Subject Headings:* **1. IGY ocean graphic program 2. Oceanic circulation 3. Sea level variations 4. Ocean currents** *Author's abstract.*

12M–54 551.506.22:551.46(5

IGY activities in oceanography. *Journal of Scientific and Industrial Research, Sec.* New Delhi, 17(12), Special Supplement, Dec. **1958.** p. 94. **DWB, DLC**—A summary of Indian IGY program is given. This includes: observation and measurement of surface tempe tures and salinities, wind direction and velocity, surface air pressure and temperature, and a observations of deep sea temperatures and salinities, tidal currents etc. Observations on und water acoustics will be made. *Subject Headings:* **1. IGY oceanography program. 2. Ocea graphic research programs 3. India.**—*W.N.*

12M–55 551.506.22:551

Internationale geophysikalische Zusammenarbeit. [International Geophysical Coope tion.] *Naturwissenschaftliche Rundschau,* Stuttgart, 12(7):273–274, July **1959. DWB, DL** The oceanographical achievements of the International Geophysical Cooperation are review The exploration of deep-sea currents was in the foreground. New discoveries in the Gulf Pacific related to morphology, geology and mineralogy of the bottom of the oceans are report Some parts of the Pacific Ocean are still heated by lava eruptions from undersea volcanos. depth of 11,034 m was measured in the Marianas by the Soviet expedition vessel "Vitiaz." T thinnest 2km spot of the earth's crust was discovered east of the Easter Island. *Subject He ing:* **1. International Geophysical Cooperation.**—*O.T.*

12M–56 551.506.22:551.

Lill, Gordon G. (*Geophysics Branch, ONR*); Revelle, Roger R. (*Scripps Institution of O nography, La Jolla, Calif.*) et al., **Oceanography program: first twelve months.** *Ameri Geophysical Union, Transactions,* 39(5):1011–1017, Oct. **1958.** 2 figs., 2 tables. **DWB, DL** Over 20 countries are engaged in coordinated studies of the circulation and currents of the n ocean basins. A general report on their observations during the IGY is presented. The re covers the IGY Island observatory program, the carbon dioxide and radiochemistry studies, the future plans. *Subject Heading:* **1. IGY oceanography program.**—*N.N.*

12M–57 551.506.22:551.46:06

*†Lumby, J. R. (*A. & M. College of Texas*), **IGY World Data Centers for Oceanograp** *The Texas Journal of Science,* San Marcos, 11(3):259–269, Sept. **1959.** 4 figs., 10 refs.

printed as *Texas. A. & M. College. Dept. of Oceanography and Meteorology. Contributions in Oceanography and Meteorology*, 5(125/153):165–175, 1958/1960, issued **1960. DWB, DLC**—The different tasks of World Data Centers for Oceanography as well as those of research ships, as organized for the IGY, are surveyed. The sea level program, also designed to promote information on the water exchange between sea and air, in May 1958 lead to the discovery of a 14-month oceanic tide due to the precession. In addition to seasonal fluctuations of water level long-term changes caused by melting of the polar ice cap are of practical importance as illustrated on the map showing the extent of the encroaching sea on the east coast of the United States luring the next fifty years. Long period wave studies are more or less experimental at present. The program to be carried out by ships emphasizing the earth's heat budget has already obtained some results on the paths of deep water masses by measurement of salt content and dissolved oxygen. These studies of the deep circulation have implications for the disposal of radio-active waste at sea. The study of carbon dioxide exchange with the atmosphere bears on climatic changes and the shape of the ocean beds. *Subject Headings:* **1. IGY oceanographic program 2. IGY World Data Centers.**—*O.T.*

INTERNATIONAL OCEANOGRAPHIC CONGRESS

12M–58 551.46:061.3

AAAS to hold International Oceanographic Congress. *Science*, Wash., D. C., 130(3370):257–258, July 31, 1959. **DLC**—The first International Oceanographic Congress will be held at he United Nations headquarters in New York from Aug. 30 through Sept. 11. Oceanographic essels from France, U.S.S.R., and the United States will be in New York habor and may be isited. *Subject Heading:* **1. International Oceanographic Congress 1959.**—*E.Z.S.*

12M–59 551.46:061.3

International Oceanographic Congress to meet at United Nations headquarters. *Science*, Vash., D. C., 130(3372):375–376, Aug. 14, **1959. DLC**—The AAAS, UNESCO's International Advisory Committee on marine sciences, and the special committee on oceanic research of the nternational Council of Scientific Unions, are sponsoring the meeting which is receiving financial upport from 21 government and private agencies. Some 30 papers will be offered by leading oceanographers and 460 brief addresses will be given. Scientists representing more than 35 ountries will attend during the session from Aug. 31 to Sept. 12. Seven oceanographic vessels re expected to be on display at New York piers. *Subject Heading:* **1. International Oceanographic Congress 1959.**—*E.Z.S.*

12M–60 551.46(02)

†International Oceanographic Congress, 1st, N. Y., Aug. 31–Sept. 12, 1959, **Preprints of bstracts of papers to be presented at the afternoon sessions (of the First Congress).** Ed. y Mary Sears. Wash., D. C., American Association for the Advancement of Science, **1959.** 022 p. figs., refs., tables. Bibliography of refs. cited in the abstracts, p. 994–1022. "Summaries in English (mostly), with abstracts in a second language." For listing of articles, see 2(3)625, March 1961, *Met. Abs.* These articles abstracted separately. **DWB** (551.46082 61pr)—This volume of summaries in English with abstracts in a second language, was intended o serve both as a guide to the discussions and as a basis for the communication and exchange of deas during the first International Oceanographic Congress, planned to provide a forum for he exchange of information and ideas on the most recent developments in the study of the oceans. n arrangement the volume follows the five general topics of the Congress—History of the Oceans, Populations of the Sea, The Deep Sea, Boundaries of the Sea, and Cycles of Organic and Inorganic ubstances in the Sea. *Subject Headings:* **1. International oceanographic proceedings 2. Oceanography books. I. Sears, Mary** (*ed.*)—*I.S.*

12M–61 551.46:061.3

International Oceanographic Congress. *Current Science*, Bangalore, 28(10):398, Oct. **959. DWB, DLC**—A brief report of the important resolutions made by the First International Oceanographic Congress during its two week session at U. N. Headquarters in New York, on ept. 12, 1959. The paper reports three major projects outlined by the Congress. ICSU's pecial Committee on Oceanic Research announced plans for a major international research roject in the Indian Ocean. Another project outlined will tackle questions concerning the age f the earth's crust and the original formation of the oceans. The third project calls for a worldide study of the radioactivity of the ocean waters. The paper also reports other topics which roused special interest at the Congress. The session was attended by more than 1100 scientists rom at least 45 nations. *Subject Headings:* **1. First International Oceanographic Congress . Oceanographic congresses.**—*I.S.*

12M–62 551.46:061

Deacon, G. E. R., **International Oceanographic Congress.** *Nature,* London, 184(4699) 1605–1606, Nov. 21, **1959. DWB**—A report of the first I.O.C., which took place at the U. Headquarters in New York during Aug. 31–Sept. 11. The program was arranged around five ma topics: "History of the Oceans," "Populations of the Sea," and "The Deep Sea," "Boundaries the Sea," and "Cycles of Organic and Inorganic Substances in the Sea." Each theme had tw morning sessions and in the afternoons the audience participated in four group discussions papers related to the morning topics. The papers read in each section are summarized. *Subje Headings:* **1. International Oceanographic Congress reports 2. Oceanographic Congresse** —*I.S.*

12M–63 551.46:061

Wolfle, Dael (*Exec. Officer, Science, Wash., D. C.*), **The Oceanographic Congress.** *Scien* Wash., D. C., 130(3378):761, Sept. 25, **1959. DLC**—Sept. of 1959 was a good time for t First International Oceanographic Congress because a wealth of IGY information became ava able at that time and also because the National Academy of Sciences published a comprehensi report on the necessity for a great expansion of oceanographic research. Over 1100 scienti from 54 countries discussed problems, centering around five topics: history of the oceans, pop lations of the sea, the deep sea, boundaries of the sea, and cycles of organic and inorganic su stances in the sea. *Subject Headings:* **1. Oceanographic research 2. First Internation Oceanographic Congress.**—*E.K.*

OTHER INTERNATIONAL OCEANOGRAPHIC ORGANIZATIONS

12M–64 551.46:06.0

Deacon, G. E. R., **International co-operation in marine research.** *Nature,* London, 18 894–895, Nov. 2, 1957. **DLC.** Reprinted as *National Institute of Oceanography, Wormley, Su rey, England, Collected Reprints,* 6(225), Dec. 1958. **DWB**—UNESCO initiated a Mari Science Program in 1955 with the formation of an International Advisory Committee on Mari Sciences selected from all countries to represent all aspects of the study. The committee hol meetings, provides visiting lectures, traveling fellowships, and short courses. Grants have be made to symposia arranged by organizations such as the Association of Physical Oceanograp and the International Council for the Exploration of the Sea. UNESCO is studying the feas bility of joint ownership of research vessels. The International Council of Scientific Unic receives a large annual grant from UNESCO. It set up a Special Committee on Ocean Resear which held its first meeting at Woods Hole. The special committee agreed upon the need f international collaboration in studying the deep ocean, suggested usable techniques, and urg that the Indian Ocean be studied after a short preparatory period. *Subject Headings:* **1. Oce research programs 2. UNESCO 3. International Advisory Committee on Marine Scienc** —*E.Z.S.*

12M–65 551.46:061.3(0

Mosby, Håkon (*Geophysical Institute, Norway*), **International organizations in the mari sciences.** *International Council of Scientific Unions, ICSU Review,* 1(4):179–183, Oct. 19 —The article gives a brief historical survey of the different international organizations in t marine sciences. Origin and objects of three organizations are treated in more detail: 1) t IAPO (International Association of Physical Oceanography) established by the IUGG; 2) t IACOMS (International Advisory Committee on Marine Sciences) established by UNESCO; the SCOR (Special Committee on Oceanic Research) set up by ICSU. A list of members of t three groups is presented; in order to secure the coordination of the work of the groups so common members were appointed. *Subject Headings:* **1. Marine sciences 2. Historical surv 3. International organizations.**—*A.V.*

12M–66 551.46:06.0

Brun, A. F.; Sverdrup, H. U.; Deacon, G. E. R. et al., **L'évolution des recherches océanographie [and] Création du Comité Consultatif International des Sciences de la M** [Evolution of research in oceanography [and] The creation of an International Advisory Co mittee on Marine Sciences.] *International Union of Geodesy and Geophysics, Bulletin d'Inform tion,* 5(13):109–119, March **1956. DLC**—Under the aegis of UNESCO several steps w initiated in 1952 to direct and support scientific organizations of oceanography. Resolutions c cerning creation of committees, and organization of regional groups of experts were approv The International Advisory Committee on Marine Sciences was formed. As a result of t endeavor the report of the Special Committee of Deep Sea Research, dated Copenhagen, Septem 17, 1955 was presented. *Subject Headings:* **1. Oceanography research 2. International A**

sory **Committee on Marine Sciences. I. I.U.G.G. Association of Physical Oceanography**
. **Revelle, R. III. Laclavère, G.**—*O.T.*

12M–67 551.46:061.3

Revelle, Roger (*Scripps Inst. of Oceanog., Calif.*), **International co-operation in the marine**
iences. *International Council of Scientific Unions, ICSU Review,* 1(1):27–39, Jan. **1959.**
WB—The first world-wide attempt to coordinate scientific observations in all the oceans was
nducted during the IGY when 70 ships and several oceanic island stations operated to supple-
ent the existing network. Under UNESCO's science program an International Advisory Com-
ttee on Marine Sciences (IACOMS) was established and the ICSU established a Special Com-
ttee on Oceanic Research (SCOR). An outline of the program and the activities of both of
ese committees is given along with a list of the members and their countries. A brief report
the meetings held is included. *Subject Headings:* **1. Oceanography research 2. Inter-**
tional Advisory Committee on Marine Sciences.—*W.N.*

12M–68 **551.46:001:341.16**

Zenkevich, L. A., **Sessiia Mezhdunarodnogo Komiteta po morskim naukam.** [Meeting
the [UNESCO] International Advisory Committee of Marine Science.] *Privoda,* Moscow,
. 3:109, March 1957.—A short account of the first conference on Marine Science under the
spices of UNESCO, held at Lima, Peru. The author is the Soviet member of the Committee.
bject Headings: **1. Marine Science 2. UNESCO Conferences.**—*A.A.*

12M–69 551.46:061.3

Lacombe, Henri, **Compte rendu des principaux travaux.** [Proceedings of the principal
rk of the 11th General Assembly of the International Association of Physical Oceanography,
ronto, May 3–Sept. 14, 1957.] *France. Comité Central d'Océanographie et d'Étude des Côtes,*
lletin d'Information, 9(10):537–544, Dec. **1957. DWB**—The annual session of the Inter-
tional Association of Physical Oceanography was held in Toronto, May 3 to Sept. 14, 1957.
nong the subjects discussed, the theoretical and practical problems associated with the evapora-
n from the ocean and the methods, as suggested by various workers in the field, of solving
ese problems were emphasized. A complete record of the proceedings is given. *Subject Head-*
s: **1. International Association of Physical Oceanography 2. Oceanographic research**
ograms.—*N.N.*

12M–70 551.46:061.3

Lee, A. J. and Cushing, D. H., **International Council for the Exploration of the Sea.**
ture, London, 184(4694):1180–1184, Oct. 17, 1959. **DWB**—The International Council for the
ploration of the Sea was assigned to carry out a Polar Front Survey in the North Atlantic
ean as part of the IGY oceanographic program. Forty-six research and other ships of eleven
ions took part in this survey. At a meeting held at the Council headquarters in Copenhagen
ring October 1–3, 1959, 45 papers were presented dealing with the first results of the survey.
is report contains reviews of these papers. Since these papers in general, relate to hydrography
l biology, the discussion is divided under the same two headings. *Subject Headings:* **1. IGY**
eanographic programs 2. International Council for the Exploration of the Sea 3. Polar
ont surveys 4. North Atlantic ocean.—*I.S.*

12M–71 551.46:061.3

Picotti, M. and Maldura, C., **La XLV riunione del Consiglio Permanente per l'Esplora-**
ne Scientifica del Mare (Bergen, 30 settembre–8 ottobre 1957). [The 45th meeting of the
ernational Council for the Exploration of the Sea.] *Trieste. Istituto Sperimentale Talasso-*
fico, Pubblicazioni, No. 345, **1958.** 12 p. "Autori e titoli delle comunicazioni presentate alla
nione," p. 10–12. Reprinted from *La Ricerca Scientifica,* Vol. 28, No. 4, April **1958. DWB,**
C—The minutes of the 45th meeting include committee announcements. A list of the papers
l communications presented at the meeting is included. *Subject Headings:* **1. International**
uncil for the Exploration of the Sea—45th meeting 2. Oceanography symposia.—*E.Z.S.*

12M–72 551.46:061.3

The Special Committee on Oceanic Research (SCOR). *International Council of Scientific*
ions, ICSU Review, 1(4):199–203, Oct. **1959. DWB**—Report of the second meeting of SCOR
ecial Committee on Oceanic Research) held in Paris on Sept. 26–27, 1958 in conjunction with
ESCO's International Advisory Committee on Marine Sciences (IACOMS). At this meeting
ommendations were made for the continuation of the IGY oceanographic research during 1959,
cerning study of sea-level spectrum; long waves; general circulation of the ocean; carbon

fluxes in ocean and atmosphere; and geophysical exploration under the sea floor. The program of SCOR was outlined: co-operation with SCAR in Antarctic Research; an Intern Indian Ocean expedition 1959–1962; and other projects which can best be done by interna co-operation. *Subject Headings:* 1. Oceanographic research 2. Special Committee on Oc **Research, 2d meeting, Paris, 1958. IGY oceanographic program 3. International Ad Committee on Marine Sciences.**—*A.J.*

MANUALS AND AIDS

See also: **Beaufort weather notation in marine meteorological observations** (Canada), 12M–361; **Weather information for shipping** (Netherlands), 12M–3

12M–73 551.4

Zenkevich, L. A., "Oceanology" versus "Oceanography." *Deep-Sea Research*, L 4(1):73, Dec. 1956. **DLC**—Suggests the use of the name oceanography for physical oc raphy, bottom relief and sediments but not for marine biology, and oceanology for the science of the ocean "physical, chemical, geological and biological." *Subject Headings:* 1. **nography definitions 2. Terminology.**—*J.T.*

12M–74 551.46:551.501.4

Müller, Johannes, Krauss, Joseph and Berger, Martin, **Handbuch für die Schiffsfü Vol. 1. Navigation.** [Handbook of navigation. V. 1. Navigation.] 4th ed. rev. Springer, 1950. 549 p. charts, diagrs., graphs, tables, eqs., refs. **DLC** (VK555.M8 book is concerned with the technical details of life and work at sea. There are chapters with such topics as navigation (comprising radar and radio beacons), meteorology, oceano and mathematics. Ch. VII on Meteorological navigation goes into the details of marine o tions made by ships officers, with necessary tables and charts for computation, are inc included. The marine synoptic code and its use in reporting or making weather charts the forms for recording observed in the new (1949) international code, many practical ru forecasting storms and hurricanes, the operation of weather reporting and warning servic finally some rules for navigation in respect to winds and weather, and for navigation in are given. Oceanography is treated in a similar way enabling the reader to obtain a knowledge of the subject. *Subject Headings:* **1. Marine meteorology 2. Synoptic 3. Oceanography 4. Handbooks.**—[illegible]

12M–75 551.501.1:551.46

Kulinskii, D. M., **O nivelirovanii morskikh vodomernykh postov.** [The level marine hydrographic stations.] *Meteorologiia i Gidrologiia*, Leningrad, No. 1:58–60, Jan **DWB, DLC**—In 1957 the marine hydrometeorological network received manuals on the hydrographic stations, especially the Methodological Instructions of the State Institute of O raphy and Instructions for Hydrometeorological stations and posts. The author exami detail the instructions and calls attention to a series of errors contained in them. *Subj ings:* **1. Hydrographic manuals 2. Hydrometeorological station leveling.**—*I.L.D.*

Data Compilation and Processing

See also: **Use of digital computers**, Mohammed Hassan, 12M–88

12M–76 551.46:681.14:621

Woods Hole Oceanographic Institution, **Proceedings of the Conference on Automati Handling for Oceanographic Observations, Woods Hole, Massachusetts, Oct. 8–** Contract Nonr-1721(00). Technical Report (unnumbered), Feb. 1960. 14 p. 2 figs. **DWB** (551.46 W913pro)—This report analyzes the general requirements for automatic tion, storage, reduction and analysis of data from oceanographic observations as discusse Conference at Woods Hole attended by nine specialists from five institutions. Ana digital electronic computers was presented. The WHOI (Woods Hole Oceanographic I data handling system which has been in operation at Woods Hole during the preceding described and standards set by the IRIG (Inter Range Instrumentation Group) problem of data acquisition over long periods (up to 1 year) as well as for short pe hours) are considered. *Subject Headings:* **1. Automatic oceanographic data process Oceanographic data processing 3. Digital electronic computers 4. Machine method**

12M77 551.465:581.14

Kilmer, R. E., and Duxbury, A. C., **Analytical system for interpolation and calculation of dynamic heights.** Texas. A. & M. College. Dept. of Oceanography and Meteorology, Contract N7onr-48702, Project NR 038-036, Technical Report 59-24T, Nov. **1959.** 32 p. figs., tables 4 refs. **DWB** (M:441.46 T355oc)—The A. & M. College of Texas has developed a high speed analytical system for calculating and compiling deep sea data. An IBM 650 computer and other equipment is used in handling the new data and an IBM 407 accounting machine is used to list final data on "multilith" stencils. The results obtained can easily be duplicated and changed to meet international values. Variations, if any, in the interpolated curves which do not meet the approval of particular oceanographer can be easily changed. The program is described in detail. *Subject Headings:* 1. **Deep sea research** 2. **Electronic computer applications to oceanography.**—*N.N.*

12M–78 551.465.12

Pollak, M. J. (*Johns Hopkins Univ.*), **Static stability parameters in oceanography.** *Journal of Marine Research,* New Haven, Conn., 13(1):101–112, Oct. **1954.** 2 figs., table, 15 refs., eqs. **DWB**—The use of static vertical stability criteria in oceanography is discussed and two basic types of such stability parameters are derived. It is shown how these can be determined by using sound velocity as one of the variables. Computation can be simplified by means of a graph. *Subject Heading:* 1. **Oceanic stability parameters.**—*Author's abstract.*

CHARTS AND ATLASES

See also: **English fishery research** (Graham) 12M–88; **Climatological and sea surface current charts of North Atlantic** (Great Britain) 12M–562; **Monthly meteorological charts and sea surface current charts, Greenland and Barents Sea** (Great Britain) 12M–569; **Preparation and use of weather maps** (U. S. Weather Bureau) 12M–570.

APPLICATIONS

See also: **Scientists go to sea** (Magat) 12M–39.

NAVIGATION

See also: **Handbook of Navigation** (Müller) 12M–74; **Inertial navigation** (Hovorka) 12M–94; **Application of wave forecasts** (James) 12M–506; **Gust windstorm project in East China Sea** (Fukuoka District) 12M–521; **Meteorological conditions North Pacific** (Hakodate) 12M–524; **Relations between Beaufort Scale and swell scale** (Walden) 12M–548; **Ocean weather maps** (McCarthy) 12M–564; **Use of weather maps at sea** (U. S. Weather Bureau) 12M–570; **North Atlantic navigation** (Rowe) 12M–572; **Influence of weather on shipping** (Canlas) 12M–578; **Meteorological and oceanographic navigation** (Cooperman) 12M–580; **Weather and Atlantic Ocean travel** (Creasi) 12M–581; **Time tracks based on wave conditions** (Holcombe, MacDougall et al) 12M–585; **Storms near Cape Horn** (Jasper, Birmingham) 12M–588; **Weather services to shipping, Indian Ocean** 12M–589; **Meteorological navigation** (Noat) 12M–595; **Voyage from Norfolk, Va. to Reykjavik** (Rodewald) 12M–597; **Southerly route** (Rowe) 12M–600; **Ship accident through sunset** (Schindler) 12M–602; **Marine corrosion of metals** (Seĭfer) 12M–603; **Drifting stations** (Treshnikov, Tolstikov), 12M–835.

12M–79 551.5:656.6

Frankcom, C. E. N., **An introduction to meteorological navigation.** *Marine Observer,* London, 29(185):137–140, July **1959. DLC**—The President of the WMO Commission for Marine Meteorology presented the introductory lecture to a series given in Hamburg in October 1956 on "meteorological navigation," a subject of particular importance to weather forecasters. Frankcom discusses visibility, the behavior of winds, and many other weather conditions essential to meteorological navigation. *Subject Heading:* 1. **Meteorological navigation.**—*N.N.*

12M–80 551.48:061.1(73)

Hanssen, George L. (*Div of Oceanography, Hydrographic Office, Wash., D. C.*), **The U. S. Navy Hydrographic Office ship routing program.** *Navigation,* Los Angeles, Calif., 6(3):157–165, Autumn **1958.** 6 figs., table, 4 refs. **DWB, DLC**—This paper presents a resume of the methods, operational techniques employed, and a preliminary evaluation of the routes prepared during the initial testing period of the Hydrographic Office ship routing program. Charts a graphs are included. *Subject heading:* **1. Ship routing program.**—*N.N.*

12M–81 551.463.2:534.2:539.385:629.

Kumai, Toyaji, **Added mass moment of inertia induced by torsional vibration of shi** *Fukuoka, Japan, Kyushu Univ. Research Institute for Applied Mechanics, Reports,* 7(28):23 243, **1959.** 9 figs., 2 tables, 7 refs., 3 eqs.—An investigation is made of the added mass mome of inertia induced by the rotational motion of prisms having sections similar to the hull sectio on water to obtain the information to estimate the natural frequency of the torsional vibrati of ships. Special consideration is given to the effect of the draught upon the added mass mome of inertia in the present study. Experimental studies using prismatic models with the section forms of the main stations of the hull of a tanker are also carried out confirming the theoreti calculation. As a result of the present investigation, a convenient formula for estimation of t added mass moment of inertia induced by the torsional vibration of a tanker, for an example, deduced for practical use. *Subject Headings:* **1. Transmission of vibrations 2. Torsion vibration 3. Ship vibrations.**—*Author's abstract.*

12M–82 532.58:551.465:629.12:534

Kumai, Toyaji, **On the virtual inertia coefficients for the vertical vibration of shi** *Fukuoka, Japan. Kyushu Univ. Research Institute for Applied Mechanics, Reports,* 7(28 245–258, **1959.** 14 figs., 2 tables, 12 refs., eqs.—An investigation is made of the vertical inert coefficients for the vertical vibration of ships by means of the strip method, taking the effe of the virtual rotatory inertia of the water and the three-dimensional motion into account. F estimating the three-dimensional correction factors of the virtual inertia coefficients for t vertical vibration of ships, experimental studies on the vibration of cylindrical solid models wi several kinds of sectional forms are carried out and their results are taken into account. T analyses of the three-dimensional motion of the circular and elliptic cylinders on the water, a the experimental studies of the measurements of the virtual inertia coefficients for the vibratio of the solid beams and the tanker model are presented in Appendices I and II, respective *Subject Heading:* **1. Ship vibrations.**—*Author's abstract.*

12M–83 551.326.7:551.468:551.5:656.6

Lauber, Rolf, **Eis- und Schiffahrtsverhältnisse Küstenbereich der DDR winter 1957/** [Ice and navigation conditions in the coastal region of the German Democratic Republic wint 1957/58.] *Zeitschrift für Meteorologie,* Berlin, 12(11/12):362–396, Nov./Dec. **1958.** 3 fi German summary, p. 362. **DWB, DLC**—A survey of the ice and shipping conditions prevaili during the winter of 1957–1958 along the coastal region of the German Democratic Republ The regional differences are pointed out and explained. Ice and thaw periods are relative to t large scale weather situations. Possibilitis for judging ice and shipping conditions are clarifi and the application of the Prüfer method to areas which are not uniform in respect to tran portation as well as to long period comparisons is rejected. The unsatisfactory Nusser ice to is replaced by a newly defined total according to which the last 12 winters are compared. Da on ice intensity and water temperature and remarks regarding the ice preparation period bas on Nusser's method are presented. *Subject Headings:* **1. Ice conditions 2. Navigation con tions 3. Coast of German Democratic Republic.**—*Translation of author's summary and I.L.*

12M–84 551.555.6:551.326.8(282.272

Rodewald, Martin, **Schiffe in der Eisklammer des St. Lorenz-Stroms.** [Ice bound ships the St. Lawrence River.] *Wetterlotse,* Hamburg, No. 141:11–14, Jan. **1959. DWB**—A br synoptic analysis suggests the way the November cold wave over the St. Lawrence River caused ships to become ice bound Dec. 1958. *Subject Headings:* **1. Cold waves 2. River ice 3. Lawrence River, United States.**—*W.N.*

FISHERIES

See also: **Pacific Ocean Fishery Investigations** (Stroup) 12M–48; **Storm situation at Svinöy** (Mertins) 12M–534; **Storm frequencies** (Mertins) 12M–556; **Fishery research vessel** (Hempel) 12M–584; **Upwelling in Gulf of Panama** (Rodriguez) 12M–903; **Hydrologic regime of the North Sea** (Selitskaia) 12M–1030.

12M–85 551.465:593.14:639.2(2

Batalin, A. M., **Okeanologicheskie issledovaniia v dal'nevostochnykh vodakh v sviaz razvitiem rhybnogo promysla.** [Oceanographic investigations in the Far Eastern waters tion to the development of the fish industry.] *Akademiia Nauk SSSR. Okeanograficheskaia missiia, Trudy,* 3:28, 1958. DLC (GC1.A47A2)—A brief resumé of a report. If the success he fishing industry is to be increased among other things it will be necessary to investigate distribution of planktonic and benthonic forms, seasonal changes of the currents and in parar the Kuroshio and other currents in the northwest Pacific Ocean. *Subject Headings:* **ishing industry 2. Northwest Pacific Ocean**—*E.Z.S.*

12M–86 551.46(57)(26):639.2

Bruun, Anton F. (*Zoological Museum, Copenhagen*). **On the restricted distribution of two p-sea fishes. *Borophryne apogon* and *Stomias colubrinus*.** *Journal of Marine Research,* Haven, Conn., 17:103–112, 1958. 2 figs., 2 tabs., 10 refs. **DWB, DLC**—The restricted ribution of *Borophryne apogon* and *Stomias colubrinus*, both bathypelagic fishes, is notable. ough relatively few specimens have been caught to date, there is good evidence to indicate their geographical distribution is limited. Knowledge about the epipelagic life of the early es and about the bathypelagic life of the adolescents and adults of these species has been bined with our recent knowledge of ocean currents in the Pacific (including the Cromwell rent) to provide an explanation of their peculiar distribution. *Subject Headings:* **1. Bathygic fishes 2. *Borophryne apogon* 3. *Stomias colubrinus*.**—*Author's abstract.*

12M–87 551.464:639.2

Carruthers, J. N. (*Natl. Inst. of Oceanog., Wormley, Godalming, Surrey*); Gogate, S. S. *ntral Marine Fisheries Res. Station, Bombay*); Naidu, J. R. (*Inst. of Sci. Bombay*) and astu, T. (*Fisheries Biology Br. Food and Ag. Org., Rome*). **Shorewards upslope of the r of minimum oxygen off Bombay: its influence on marine biology, especially fisheries.** *ure, London,* 183(4668):1084–1087, April 18, 1959. 3 figs., tables. 3 refs. **DWB**—Brief rt on some investigations conducted off Bombay Oct.–Nov. 1958, when the NE monsoon is ciated with upwelling and rise of the minimum oxygen layer. This in turn results in high kton production and consequently huge fish concentrations available to local fishermen. The r boundaries of this layer seem to rise and fall with the tides. During the SW monsoon the r sinks. The behavior of the surface layer of the Arabian Sea, while season conditioned, is too well understood but may be influenced by the Red Sea and Persian Gulf flows. *Subject dings:* **1. Upwelling 2. Oxygen distribution 3. Nutrients in sea water 4. Plankton ply 5. Fish supply 6. Arabian Sea**—*W.N.*

12M–88 551.46:639.2

Graham, Michael. **English fishery research in norther waters.** *Arctic,* 6(4):252–259, Dec. . 6 figs., 3 refs. **DLC**—Charts show general current system of western Barents Sea and ion of 2 standard hydrographical sections (one W. from Bear Island and one S. to Lappen. way) which are surveyed for currents and water temperature, etc. periodically by the "Ernest ," fisheries research trawler. Loss of highly accurate thermometers was at first so great simplifications in procedure were necessary. The horizon is almost always obscured by fog. d or snowstorm, even in summer. *Subject Headings:* **1. Fishing industry 2. Temperature ea water 3. Ocean currents 4. Barents Sea 6. Bear Island.**—*M.R.*

12M–89 551.506.5(99):551.46:639.245 1(99)

Kirillov, I. F. and Rybnikov, A. A.. **Desiat' let nauchnoĭ raboty Gosudarstvennogo okeaaficheskogo instituta na kitoboĭnoĭ flotilii "Slava" v Antarktide.** [Ten years of scientific by the National Oceanographic Institute with the whaling fleet "Slava" in the Antarctic.] *orologiia i Gidrologiia,* Leningrad, No. 8:28–29, Aug. 1958. 2 refs. **DWB, DLC**—Since the Antarctic whaling fleet has been accompanied by scientists of the State Oceanographic tute who conducted meteorological, hydrological and biological observations providing informaon the hydrological and meteorological conditions of the southern Atlantic and Antarctic rs. Publications of the Oceanographic Institute contain scientific data of four whaling expedi-. Studies on the effect of environment upon whales have been carried out. It was found temperature and salinity do not influence substantially the distribution of plankton. Whale is found both in warm and cold ocean surfaces to depths of 100–200 m. Phosphates are important in the distribution of zooplankton. The distribution of the transparency and of the water in whaling areas indicate that the former gradually diminishes in the summer the latter varies from blue to green-blue and green as plant plankton increase. In areas rge concentration of whales a sharply marked layer of temperature jump is observed. her comments on the temperature jump layer near the ice crust, transparency of water and of temperature jump layer, relationship of whales to storms, etc., are presented. *Subject ings:* **1. Whaling 2. Antarctic surveys.**—*I.L.D.*

12M–90 551.526.6:551.46:639.222(

Mukai, M., **On the relation between sardine catch and sea conditions in the west area off Kyūshū.** *Journal of Meteorological Research,* Tokyo, 10(8):708–713, Aug. **1958.** 6 3 tables, 3 refs., eqs. In Japanese. **DLC**—A study of the relations of sea conditions, an range of water temperature, and fishing success under the special geographic conditions in the sea areas off Kyushu: Koshima-oki (33.15–33.45°N, 128.45–129.00°E), Koshima-nata (32 32.40°N, 128.55–129.10°E), Iwojima-oki (32.35–32.45°N, 129.30–129.45°E), Amakusasatsu (32 32.40°N, 129.40–130.00°E). The data cover the period from Sept. of 1950 to July of 1952, are calculated, giving a diurnal mean of water temperature, 10-day water temperature, and amount of the fishing catch in each area. A figure shows frequency distribution and no distribution of the fishing catch. The fish catch is generally higher in spring and autumn an high water temperatures in the southern area, and that all areas have about the same amoun catch except the sea area of Amakusasatsu, due to the inclination of the water temperature. *ject Headings:* **Temperature of sea water 2. Sardine catches 3. Kyūshū, Japan.**—*K.C.*

12M–91 551.467:551.326.7:63

Sawada, Teruo, **A study of the relationships between the fishery and the drift-ice on Okhotsk Sea.** *Journal of Meteorological Research,* Tokyo, 11(12):1005–1009, Dec. **195** figs., 3 tables, ref., 4 eqs. In Japanese. **DWB**—Drift-ice on the Okhotsk Sea occurs from to April of each year and disturbs fishing operations. This paper presents a statistical s of the fish catch, correlation between drift-ice and fishing, days of sailing and days when fis is prevented by drift-ice in the sea area of Soya, Abashiri, Nemuro and Shiretoko, from 195 1958. *Subject Headings:* **1. Drift-ice fishery relationships 2. Okhotsk Sea**—*K.C.*

12M–92 599.745:59

Yasuda, Fujio and Hiyama, Yoshio, **A measure of role of utilization of plankton fee by carnivorous fishes in a certain area.** *Records of Oceanographic Works in Japan,* To n.s. 5(1):85–90, Feb. **1959.** 7 tables, 3 refs., 4 eqs. **DWB**—It was found that three sp of squid were the dominant carnivorous forms (Index of relative abundance) and that they the most powerful predators playing the biggest role in consumption of plankton feeders in Mo Bay and Koajiro Bay. *Subject Headings:* **1. Plankton feeders 2. Squid 3. Moroiso Japan 4. Koajiro Bay, Japan.**—*E.Z.S.*

MILITARY

See also: **Scientists go to sea** (Magat), 12M–39; **Oceanography in U. S.** (U. S. Congress), 12M–50; **Motions of a ship in sea waves** (Cartwright), 12M–579; **Arctic problems** (Lyon), 12M–831.

12M–93 551.465:532.59:6

Farmer, Harlow G. (*Woods Hole Oceanog. Inst.*), **Oceanographic factors affecting phibious warfare.** (In: Woods Hole Oceanographic Institution, Woods Hole, Mass. **Env mental factors influencing the performance of naval weapon systems.** Woods Hole, p. 97–114. 8 figs., table, 20 refs., 8 eqs.) **DWB** (M:623.4 W894en)—The importance to phibious warfare of knowledge of the physical characteristics of the sea surface in the near- zone is discussed. The factors responsible for the generation of ocean waves are consid The process involved in wave formation, questions such as: how waves approach the beach; waves are transformed and refracted in their progress from deep water into shallow water; waves at some critical depth become unstable, are explained theoretically. Several ways in waves may determine the selection of the assault beach or adversely affect an operation are sidered. The paper is well illustrated. *Subject Headings:* **1. Ocean waves 2. Military sci** —*I.S.*

12M–94 551.5:551.46:6

Hovorka, John (*Instrumentation Lab., MIT*), **Inertial navigation.** (In: Woods Hole Oc graphic Institution, Woods Hole, Mass. **Environmental factors influencing the performan naval weapon systems.** Woods Hole, **1959.** p. 125–131. 3 figs., 3 refs.) **DWB** (M: W894en)—Inertial guidance extends the techniques of automatic position indication and auto steering in navigating by making the minimum number of measurements of the environmen by the avoidance of radiative contact. The important and for certain periods of time the measurement which is made, is the total force on the vehicle. This paper first discusses the va features of the force measurement and then considers the requirements for other measurem *Subject Headings:* **1. Navigation 2. Inertial navigation.**—*I.S.*

12M–95 551.5:551.46:623.94

Iselin, Columbus O'D. Introduction. (In: Woods Hole Oceanographic Institution, Woods le, Mass. **Environmental factors influencing the performance of naval weapon systems.** oods Hole, **1959.** p. 1–8.) **DWB** (M:623.4 W894en)—A brief review is presented of the plications of oceanography and meteorology in modern naval warfare. This is illustrated by the tance of World War II when it was found that submarine detection could be limited by oceano- aphic factors and the consequent need for oceanographic forecasting was felt. Some of the wer applications of oceanography in naval warfare since World War II have also been outlined way of introduction. *Subject Headings:* **1. Oceanography in warfare 2. Military oceanog- phy.**—*I.S.*

12M–96 550.34:551.463.286:551.463.36

†Snay, Hans G. (*U. S. Naval Ordnance Lab.*). **Hydrodynamics of underwater explosions.** *tional Research Council, Wash., D. C., Publication* No. 515:325–352, **1957.** 21 figs., 23 refs., eqs. **DLC** (QA927.U5 1956)—A survey is given of the various hydrodynamic aspects of derwater explosions. The topics selected deal with shockwave phenomena, the behavior of the bble, surface phenomena and hydrodynamic problems of damage to structures. In particular, following items are discussed: (a) The shockwave formation by a detonating charge. The g distance propagation of shockwaves. The anomalous surface reflection. (b) The change of ape of migrating bubbles. The energy dissipation at the bubble minimum. The energy partition non-migrating and of migrating bubbles. The theoretical treatment of pulsating bubbles. gration caused by rigid or free boundaries. (c) The spray dome. The gas break-through of allow explosions. The surface phenomena of venting and non-venting underwater explosions. e plume formation. The rise of the bubble from deep explosions. (d) The reloading of an -backed plate subjected to an underwater explosion. The response of cyclindrical shells to a ockwave. The whipping of ships. *Subject Headings:* **1. Hydrodynamics of underwater ex- osions 2. Shockwave phenomena 3. Bubble mechanics.**—*Author's abstract.*

OTHER APPLICATIONS

See also: **Outline of oceanography** (Carruthers), 12M–493; **Hydrometeorological investigations,** 12M–498; **Sea conditions in connection with cables** (Betson), 12M–574.

12M–97 551.46

Deacon, G. E. R. (*Direct., U. K. Nat. Inst. of Oceanog'y.*), **The use of oceanography.** *pact of Science on Society,* Paris, 9(2):3–16, **1958.** **DLC.** Reprinted as *National Institute of eanography, Wormley, Surrey, England, Collected Reprints,* 6(222), Dec. **1958.** **DWB**—An count of some of the uses of oceanography is preceded by a brief reference to the difficulties olved in such study. Nevertheless its beneficial results make the study necessary. Study of oceans will help get more food, raw materials, and power from the sea. It will improve the efulness of the sea for navigation and for the disposal of waste. Defenses against waves, rms, floods, and the silting of harbors will be more effective. Mean sea level changes and the ect of the ocean on climate warrant serious study. International cooperation is essential in the dy and dissemination of the results. *Subject Headings:* **1. Oceanography usefulness 2. ceanographic studies.**—*E.Z.S.*

12M–98 .551.46:551.58:551.46:620.91

Deacon, G. E. R., **Okeanografiia sluzhit vsemu chelovechestvu (o nazrevshikh problemakh cheniia morei i okeanov).** [Use of oceanography to mankind (some immediate problems in study of seas and oceans).] *Priroda,* Moscow, No. 8:33–40, Aug. **1959.** **DLC**—The great portance of the science of Oceanography for mankind is considered by the Head of The British tional Institute of Oceanography. In this paper the author discusses: the significance of seas d oceans as the source of food supplies, of mineral raw materials and power energy; the im- rtance of waterways; of works carried out on the coast and in ports, the influence of oceans on the climate, as well as its being the dumpyard for industrial refuse. *Subject Heading:* 1. **eanography usefulness.**—*A.M.P.*

12M–99 551.46.077:621.889.2

Bogdanov, K. T., **Skorost' dvizheniia posyl'nykh gruzov po trosu v zavisimosti ot verkhnostnogo ugla naklona trosa.** [Rate of movement of consignment loads along a cable a function of the surface angle of inclination of the cable.] *Meteorologiia i Gidrologiia,* Lenin- d, No. 3:50–51, March **1959.** 2 figs. **DWB, DLC**—A method for determining the velocity

of bathymetric loads of different shapes along cables for cable angles range from 0° to 5
presented. The experiment was carried out with standard loads and with slanted loads l
45°. The graphs of velocity of loads along the cable for each angle are presented. It is s
that the velocity along the cable depends largely upon the vertical angle of inclination o
cable. In taking a series of bathymeters, loads with slanted bases should be used and the vel
of these loads, for example being 0.75 met/sec greater than the velocity of fall of standard l
The predominating majority of bathymetric series have shown that the angle of inclination o
cable to the bottom differs slightly from the surface. *Subject Headings:* **1. Bathymetric**
2. Submarine cables.—*I.L.D.*

12M–100 551.46.077:62

Bogdanov, K. T. and Ivanov, Iu. A., **O prichinakh obryva trosa pri vziatii glubokovod**
seriĭ batometrov. [The causes of cable breaks in taking deep bathymetric series.] *Meteoro*
i Gidrologiia, Leningrad, No. 8:49–50, Aug., **1958. DWB, DLC**—The causes for the b
in bathymetric series is a result of loss of apparatus and breaks in the cable are summa
These include the use of a new cable which has not been stretched or worked in on the p
the possibility that the load on the cable exceeds the tensile strength, and increase of the
on the cable by the winding during the letting down and lifting of the series. Theoreticall
break should occur at the moment the series is raised. Actually the break occurs usually
several hundred meters of the cable have been wound on the drum of the windlass. Durin
rise of the bathymetric series the cable rotates: the velocity of rotation depending upon the
Generally speaking the rotation should extend over the entire cable length but the suspended b
meters and the dynamic resistance of the cable itself hinder the distribution of this rotati
that the cable becomes overwound, especially between the bathymeter and the pulley. This re
the tensile strength of the cable so that a break occurs. In order to prevent this the a
recommends the following: to use pulleys with narrow rollers where width is not much g
than the diameter of the root portion of the cable and where groove has a depth not greater
the root section of the cable; when an angle arises between the plane formed by the cable pa
through the pulley these planes should be joined by the end of a rope attached from below t
pulley; to lift the bathymetric series with a speed of not more than 0.5 met/sec up to 6000 me
and the pulley should lie against the drum of the windlass. *Subject Headings:* **1. Bathym**
series 2. Oceanographic instruments 3. Bathymeters.—*I.L.D.*

EXPEDITIONS, CRUISES AND SURVEYS

See also: **Age of deep waters, Pacific** (Suess, Pakestraw), 12M–934; **Abyssal circulation in Northwest Pacific** (Uda), 12M–950; **Canadian oceanographic research, Northeast Pacific** (Dodimead, Tully), 12M–957.

ATLANTIC

12M–101 551.46:91.04(47):639.2

Alekseev, A. P., **Okeanograficheskie issledovaniia ekspeditsionnogo sudna "Sevasto**
[The oceanographic investigations of the expeditionary ship "Sevastopol."] *Priroda,* Mo
47(4):111–112, April **1958. DLC**—The I. M. Knipovich Polar Scientific Institute of the M
Fisheries and Oceanography Institute (Murmansk) put into operation the expeditionary
"Sevastopol" with a displacement of 2800 tons and a speed of 10 knots. The vessel contain
electric winches, various laboratories (hydrological, geochemical, geological, etc.); a ship n
control weather station, etc. It has space for 30 scientific investigators. From July to
1957 it completed an oceanographic traverse in the southern part of the Norwegian Sea; Ic
Faeroe Islands-Shetland Island-Scandinavian Peninsula. Material on hydrology and hydrob
was collected; actinometric observations were made. Currents were studied by means of
buoys, etc. Oceanographic studies were made also on the Danish Strait. *Subject Hea*
1. Oceanographic expeditions 2. Soviet oceanographic expeditions 3. Norwegian S
Iceland-Faeroe Islands-Shetland Island.—*I.L.D.*

12M–102 91.04(82):551.506.5:

Argentina. **Servicio de Hidrografia, Operacion Meridiano.** [Operation Meri
Buenos Aires, 1958. 31 p. fold. map, fold. table, forms (part fold.) Mimeo. On
Año Geofísico Internacional 1957–58. **DWB** (551.46 A691op)—Plans for the expedition
Argentine research ship Capita Canepa are outlined. The purpose of the expedition is to
oceanographical and meteorological measurements at predetermined stations along the 30th me
between 22° and 50°S. Instructions for performing oceanographic measurements, deep-sea
ings, meteorological surface observations and upper-air soundings, biological samplings, a

easurements, and data analyses to be completed on board are included. *Subject Headings:* **. Argentine oceanographic expeditions 2. Operation meridian 3. Marine meteorological esearch programs.**—*G.T.*

12M–103 91.04(261/264):551.552:551.465:912
Brochado, José Idalino Ferrerrira da Costa, **Descobrimento do Atlântico.** [Exploration f the Atlantic.] Lisbon, Comissão Executiva das Comemorações do Quinto Centenário da Morte o Infante D. Henrique, **1958.** 145 p. maps. (*Colecção Henriquina,* 3) **DLC** (GC271.B7)— small book describing and showing on maps details of Portuguese voyages (in 5th to 20th cenıry) of exploration in the North and South Atlantic and recent air routes from Portugal to razil. Winds and currents are indicated on maps. *Subject Headings:* **1. Atlantic Ocean xploration 2. Portuguese oceanographic expectations 3. Atlantic Ocean.**—*M.R.*

12M–104 91.04(261):551.46(261)
Lednev, V. A., **Piatyĭ reĭs ekspeditsionnogo sudna "Mikhail Lomonosov" v Atlantiheskom okeane.** [The fifth trip of the expeditionary ship "Mikhail Lomonosov" in the Atlantic cean.] *Meteorologiia i Gidrologiia,* Moscow, No. 11:69–70, Nov. **1959. DWB, DLC**—Between pril 17 and July 10, 1959 the "Mikhail Lomonosov" carried out an expedition in conjunction with he IGY program. It made two fundamental surveys: a latitudinal survey along 60°N from the aroe Island to 30°W and one along the meridian of 30°W from the continental shelf of Greenand to 22°02′S. The latter intersected the northern polar waters, the region of drift currents nd twin trade wind regions, etc. Sixty three deep water stations were set up including four 24 our anchorings at a depth of up to 5000 m. One hundred and ninety eight bathythermographic bservations were made. Observations of radiation balance and its components, echo soundings tc. were carried out and some of the results obtained included more accurate data on the nature nd velocity of currents in the water layer at several points of the northern hemisphere. The tability of the boundaries and properties of oceanic water masses and their slight variation in vater below 2000 m was established. Data on sea chemistry showing the distributions of biogenic naterial along the 30°W meridian were collected. Biological studies have led to the establishment f three distinct regions along the 30°W meridian qualitatively and quantitatively different in the omposition of plankton and benthos. There was observed a gradual diminution of bottom faune rom north to south. Between these three regions there were situated areas characterized by ery few indices of benthos biomass. *Subject Headings:* **1. Soviet oceanographic expeditions . Research vessel "Mikhail Lomonosov" 3. Atlantic Ocean.**—*I.L.D.*

12M–105 551.506.22:623.822.3
*McLellan, Hugh J., **Data reports for two IGY cruises.** Texas. Agricultural and Mechanial College. Dept. of Oceanography and Meteorology, Contract N7onr-48702, Project NR 083 036, Technical Report (unnumbered), April **1959.** 12 p. 2 maps, almost entirely tables. **DWB** 551.46 T355dat)—Two cruises, the 58 H1 and 58 H4 were made during March 23 to April 3 nd May 13 to June 29, 1958, respectively. The 58 H1 surveyed stations along the 94°30′W neridian crossing the Gulf of Mexico from north to south, to depths of 3500 meters and set up 4 hydrographic stations. 4 bottom cores were taken and 144 B-T observations were made. The 8 H4 surveyed from Galveston to Kingston, Jamaica; Charleston, South Carolina; St. Georges, Bermuda and Miami, Florida. 28 bottom cores were taken and 410 B.T. observations were made. Data are included. *Subject Headings:* **1. IGY oceanographic cruises 2. Atlantic Ocean. I. exas. Agricultural and Mechanical College. Dept. of Oceanography and Meteorology II. Contract N7onr-48702 III. Project NR 083 036.**—*N.N.*

12M–106 551.526.6:551.464/5(261)
*Peluchon, Georges (*Ingénieur hydrographe principal*), **Observations hydrologiques effecuées par l' "Aventure" en 1957 et en 1958 au nord du parallèle 48°N.** [Hydrologic observaions made by the "Aventure" in 1957 and 1958 north of parallel 48°N.] *France. Comité Central d'Océanographie et d'Etudes des Côtes, Cahiers Océanographiques,* 12(2):111–118, Feb. 959. Appendix p. 119, unnumbered pages, plates. 11 figs. **DLC, DWB**—The preliminary esults of hydrologic observations made in the North Atlantic by the "Aventure" during 1957 nd 1958 are presented in graphic form and are briefly explained. A map of the traverses made lso shows location of the observation stations along each traverse. Cross sections show the sotherms, isohalines, temperature and salinity, surface and depth curves, currents at the surface, nd at 400 m, 800 and 1500 m depths. *Subject Headings:* **1. Oceanographic surveys 2. North Atlantic Ocean.**—*E.Z.S.*

12M–107 551.46:550.3:061.3(45)
*Aliverti, G., **Sulle crociere talassografiche nel Tirreno durante l'A.G.I. 1957–58.** [Oceanoraphic cruises in the Tyrrhenian Sea during IGY 1957–58.] *Associazione Geofisica Italiana, 7th,*

Rome, Nov. 1957, Atti, pub. Rome, **[1958?]** p. 33–44. 8 figs., 2 tables.—The general I
oceanographic program is described and charts of the various oceans and seas presented to sh
cruises which cover specific areas in great detail. An explanation is given of the particular w
of the Italian IGY cruises in the Tyrrhenian and Ionian Seas, especially in the former, with d
from Cruise No. 1, July 1957, out of Genoa. 135 stations are shown on a chart and data i
table include information to 600 m depth. *Subject Headings:* **1. IGY oceanographic progr**
2. Italian IGY oceanographic program 3. Tyrrhenian Sea 4. Ionian Sea.—*M.R.*

12M–108 91.04(262) :551.46(2

D'Ancona, Umberto and Picotti, Mario, **Croisière océanographique dans la mer Adriati**
(Août-Septembre 1955). [Oceanographic cruise in the Adriatic sea, Aug./Sept. 1955.] *Trie*
Istituto Sperimentale Talassografica, Pubblicazioni, No. 334, **1957.** (5 p.) **DWB, DLC—**
account of the oceanographic cruise in the Adriatic Sea organized by the "Instituto Nazionale
Studi Talassografici" (Venice) and in which the Oceanographic Institute of Goetberg (Swed
and the Hydrobiological Station of Chioggia of the University of Padua collaberated. The aut
gives the names of the directors, outlines the scientific program, gives the log of the trip, lists
anchoring stations and describes the operational procedure and some of the apparatus. *Sub*
Headings: **1. Oceanographic cruises 2. Adriatic Sea.**—*I.L.D.*

12M–109 551.46(2

D'Ancona, Umberto and Picotti, Mario, **Crociera Talassografica Adriatica 1955, I. R**
zione Generale. [Oceanographic cruises in the Adriatic, 1955, Pt. 1, General Report.] *Trie*
Istituto Sperimentale Talassografico, Pubblicazioni, No. 348, **1958.** Reprint, p. 211–225 f
Archivo di Oceanografia e Limnologia, 11(2), **1958?** 3 figs., 2 tables, bibliog. p. 225–225. Ita
and English summaries p. 222.—A general report on the Oceanographic Cruises in the Adriatic
in 1955. A list of the hydrobiological stations employed is provided. Research consisted
studies of temperature and salinity, distribution of plankton, turbidity, bottom sediments,
relief or topography of the sea bottom. A brief discussion on historical developments and pres
concepts of oceanography. *Subject Headings:* **1. Oceanographic cruises 2. Adriatic Sea**
E.Z.S.

12M–110 551.506.5 :551.46(2

*Picotti, Mario, **Crociera talassografica adriatica 1955, III, Tabelle delle osservazioni fisi**
chimiche, biologiche e psammografiche. [Adriatic thalassographic cruise 1955, Pt. 3, Ta
of the physical, chemical, biological and psammographical observations.] *Trieste. Istituto Sp*
mentale Talassografico, Pubbl. No. 361 :372–377, **1960.** mostly tables (unpaged), 17 refs. Ita
and English summaries p. 375–376. **DWB, DLC**—The various chemical, physical, biological
psammographical observations made in the course of the oceanographic expedition of Aug
September 1955 in the Adriatic Sea, are presented in a series of tables. In these tables
indicated the conditions of the air and of the sea, the depths of each measurement level, the t
perature, the salinity, the density "in situ," the oxygenation, the pH, the nutrient salts, the cori
optical and turbidity measurements, as well as biological observations. All the data have b
collected at the various levels of immersion of the instruments. The tables are preceded b
short account, describing the methods and the units of measurements used for each determinat
Subject Headings: **1. Oceanographic data 2. Adriatic Sea.**—*Author's abstract.*

12M–111 551.46 :91.04(26

Wojnic, Bogusław, **Morskie rejsy badawcze na M/S "Zodiak."** [Investigation of sea
ages on M/S "Zodiak."] *Gazeta Obserwatora PIHM,* Warsaw, 4(10) :7–11, Oct. **1951.** i
DLC—Notes by the author who was a member of a group of PIHM (state Hydrological
Meteorological Institute) employees who took part in a series of trips on the hydrologic
"Zodiak" investigating the water, depth, and the bottom of Gdynia Gulf and of the southern
of the Baltic Sea. *Subject Headings:* **1. Oceanographic surveys 2. Gdynia Gulf 3. Baltic**
—*A.M.P.*

12M–112 551.465(26

†Wooster, Warren S., **Oceanographic observations in the Panama Bight, "Askoy" Exp**
tion, 1941. *American Museum of Natural History, N. Y., Bulletin,* 118(3) :117–152, **1959.**
figs., 43 refs. **DLC** (QH1.A4)—Topography, climatology, and the average surface and subsur
oceanographic conditions of the Panama Bight are described. Seasonal contrasts in wea
within the Bight are related to movement of the Intertropical Convergence. Measurements m
in the northern part of the Bight show a subsurface distribution of mass consistent with

xistence of a current which appears to be the eastern limb of the general counterclockwise cir- ulation in the Panama Bight. It is proposed to name it the "Columbia Current." *Subject Head- ıgs:* **1. Columbia current 2. Oceanographic expeditions 3. "Askoy" Expedition, 1941.**—*.Z.S.*

12M–113 551.5:551.46

*Worthington, L. V., **Oceanographic data from the R.R.S. DISCOVERY II International eophysical Year Cruise 3, 1958.** Woods Hole Oceanographic Institution (and) National In- itute of Oceanography, Surrey, England, Contract Nonr-2196(00) NR 083-004, [Unnumbered eport], Nov. **1959.** 75 p. Almost entirely figs. and tables + 20 charts in envelope in back. refs. **DWB** (M551.46 W894od)—The information obtained by DISCOVERY II, Cruise , during Aug.–Sept. 1958, between longitude 0°–40°W and latitude 0°–40°N is given in charts nd tables. A chart shows the position of the sections from which temperature, salinity and xygen profiles were drawn within the depth range of 6000 meters. Detailed data include the ollowing: the position of the station including the time (GMT), the depth of water, the salinity nd its separate values as determined by both the British and American conductivity bridge instru- ents, oxygen, silicate and phosphate content. Profiles are placed in a pocket in the back cover. *ubject Headings:* **1. Oceanographic data 2. IGY Cruise 3, 1958 3. Atlantic Ocean. I. ational Institute of Oceanography, Surrey, Eng. II. Woods Hole Oceanographic Institu- on III. Contract Nonr-2196(00) NR 083-004.**—*K.C.*

12M–114 551.46:92

Merriman, Daniel and Merriman, Mary (*both, Yale Univ.*), **Sir C. Wyville Thomson's etters to Staff-Commander Thomas H. Tizard, 1877–1881.** *Journal of Marine Research,* New aven, Conn., 17:347–374, **1958.** 58 refs. **DWB, DLC**—These original letters from Thomson o Tizard are concerned with the publication of the results of the "Challenger" Expedition, as ell as the study of the Faroe Channel and the eventual delineation of the Wyville Thomson idge with its diversity of "cold and warm area" bottom fauna. They also provide evidence of homson's indefatigability as well as certain historical sidelights. *Subject Headings:* **1. "Chal- enger" expedition data 2. Faroe Channel 3. Wyville Thomson Ridge.**—*Author's abstract.*

PACIFIC

See also: **Sir C. Wyville Thomson's letters to Staff Commander Thomas H. Tizard** (Merriman, Merriman), 12M–114.

12M–115 551.506.5(265):46.07:91.04(265)

California. Univ. Scripps Institution of Oceanography, LaJolla, **Shipboard report, Capri- orn Expedition, Sept. 26, 1952–Feb. 21, 1953, sponsored by the Office of Naval Research and ureau of Ships.** Its *Reference,* 52-15, Feb. 25, **1953.** 60 p. 12 figs. (some fold.) **DLC** Q115.C17)—Preliminary details of the comprehensive oceanographic expedition "Capricorn" hich occupied stations between 0° and 23°S, and between 110°W and 17°E during Oct. 1952–Feb. 953. This was the 4th of the series of oceanographic expeditions of the U. S. Navy and the niv. of Calif., but the first south of the equator. The meteorological program was sponsored y the U. S. Air Force, Cambridge Research Center. Radiosondes (182) reached 20, 10 and even mb levels. Kytoons towed by the "Horizon," made continuous soundings at 1000 ft and vertical oundings to 4000 ft to study tropospheric propagation conditions. Rain and air samples, atmos- heric electricity, thunderstorm and standard surface as well as local micrometeorological observa- ons in lagoons were made. Data are not given. *Subject Headings:* **1. "Capricorn" Expedition, 952/1953 2. U. S. Oceanographic expeditions 3. Marine meteorology 4. South Pacific cean. I. U. S. Office of Naval Research II. U. S. Bureau of Ships.**—*M.R.*

12M–116 551.46.07(26)

Paquette, Robert G., **Cruise of the "Brown Bear."** *American Geophysical Union, Trans- ctions,* 39(2):363–365, April**1958.** fig., table. **DWB, DLC**—The Department of Oceanography, Vashington University, reports on deep currents of the oceans. During July, Aug. and Sept., 957 the investigations were conducted aboard the "Brown Bear" at thirty-six oceanographic sta- ons. The objectives were: (1) to gather data for a north-south profile of water properties. 2) date the deep water by C^{14} methods. (3) conduct a survey of the chemistry of the oceans. 4) determine the routine productivity by the C^{14} methods and (5) measure the currents north of ne Kodiak Island. Biological observations, not included in the IGY studies, were also made. he preliminary results of this program, including facts on the current, oxygen concentration, tem- erature and salinity are given. *Subject Headings:* **1. Oceanographic cruises 2. "Brown Bear" ruise, 1957. 3. North Pacific Ocean.**—*N.S.*

12M–117 551.526.6:551

Fleming, Richard H. (*Dep. of Oceanog., Univ. Washington*), **Second Brown Bear cru**
American Geophysical Union, Transactions, 40(3):291–296, Sept. **1959.** 3 figs. **DWB**—
report outlines the program and gives some of the preliminary results of the Second Brown
cruise. It appears that the warmer subtropical waters moved farther north than usual in
eastern Pacific during the summer of 1958. The distribution of marine fauna reflected the hi
than average temperatures and the transitions from one water mass to another. In the so
eastern half of the cruise area an appreciable amount of Equatorial Water was mixed with
Sub-Arctic Water at depths greater than 1100–1900 feet. *Subject Headings:* **1. Second Br**
Bear Cruise 2. Water masses 3. Pacific Ocean.—*E.Z.S.*

12M–118 91.04:551.46:061.1

*Kort, V. G., **Issledovaniia dal'nevostochnykh moreĭ i Tikhogo okeana, provedennye**
stitutom okeanologii AN SSSR v 1949–1954 gg. [Investigations of the Far Eastern Seas
the Pacific Ocean conducted by the Oceanographic Institute of the Academy of Sciences of
U.S.S.R. in 1949–1954.] *Akademiia Nauk SSSR. Okeanograficheskaia Komissiia, Tr*
3:3–12, **1958. DLC** (GC1.A47A2)—A general summary of the work done by the expedit
of Vityaz between 1949–54. In addition to meteorological and aerological investigations,
marine geology was investigated in great detail, the relief, and sediments, were mapped.
biology and chemistry of the seas were studied. Numerous geophysical measurements were
which suggest various structural features. Coastal studies were also included. *Subject H*
ings: **1. Soviet oceanographic expeditions 2. "Vitiaz" expeditions 3. Pacific Ocean 4.**
Eastern Seas.—*E.Z.S.*

12M–119 91.04:551.46(266) 551.46.07

Oceanographic Expedition Downwind. *American Geophysical Union, Transactions,* 39
159–162, Feb. **1958.** fig. **DWB, DLC**—The "Downwind" Expedition in October 1957 u
took research into certain geophysical factors that influence deep sea circulation in the ce
and south Pacific Ocean. This program was sponsored by the Scripps Institution of Oceanogra
La Jolla, California. The work accomplished during the expedition is discussed and a descri
of the expedition vessels is given. *Subject Headings:* **1. Oceanographic expedition Down**
2. Central Pacific Ocean 3. South Pacific Ocean.—*N.N.*

12M–120 551.46:91.04(09):551.46.07:6

Ritchie, George Stephen, (*Capt. R.N.*), **"Challenger": the life of a survey ship.** N
Abelard-Schuman, **1958.** 249 p. illus. **DLC** (VM395. C4R5) Review by C. E. N. Fran
in *Marine Observer,* London, 28(180):103–104, April **1958.**—The history and work of the
"Challenger" and its world oceanographic cruises (1872–1876) is related, and then in 17
illustrated chapters the experiences on board the new "Challenger," a British Hydrographic
vey Ship, from 1932–1953 in many parts of the world where she made oceanographic and h
graphic surveys and even land (sled) expeditions (as in Labrador) are described. Some o
expeditions treated with great detail were the Windward Isles, Iceland, the Arabian coast
Persian Gulf, Cyprus, the East Atlantic, the North Pacific, South Seas, Borneo, Saranak, J
British Columbia and the North Sea, where she encountered ice, hurricanes, etc. The s
"Challenger" was 1200 tons (200 ft) and was launched at Chatham in 1931 and scrapped in
1953. On the world cruise (1949–51) to survey the ocean bed, she obtained a record
sounding by cable of 5899 fathoms (35,500 ft) in the Marianas Trench of the Western P
(between Guam and Ulithi). *Subject Headings:* **1. History of "H.M.S. Challenger"**
lenger expedition, 1872–76 2. "Challenger" II expedition, 1932–53 3. Hydrographic
veys 4. Ocean depth surveys 5. Western Pacific.—*M.R.*

12M–121 551.46.07:

Scripps Institution's Downwind Expedition. *Science,* Wash., D. C., 126(3281):
Nov. 15, **1957. DWB, DLC**—In 1957 the University of California's Scripps Institutio
Oceanography planned to send a 2 ship expedition for 4½ months under the leadership of H
W. Menard, Jr. to study how the deep waters of the Southeast Pacific ocean move. The ex
tion will provide data for other IGY studies in the course of the more than 38,000 mile vo
They will also make a profile of the ocean floor along the line of 130°W longitude from
latitude of San Diego, California to approximately 50°S. The atolls of the Tuamotu Archip
will be studied. One of the primary projects will be investigation of the broad rises in
southeastern Pacific. *Subject Headings:* **1. Oceanographic expeditions 2. Downwind ex**
tion 3. Southeast Pacific Ocean.—*N.N.*

12M–122 551.5:551.46:06(52)

Suda, K. and Hikosaka, Shiegeo (*both, Japanese Hydrographic Office, Tokyo, Japan*), **Gen-ral report of Japanese participation in "Equapac."** *Pacific Science Congress, 9th, Bangkok, 957, Proceedings,* Vol. 16, pub. **1958.** p. 222–223. **DWB** (M(06) P1117p)—Six agencies and ven vessels of Japan participated in Equapac. This report outlines their work in Physical and hemical Oceanography, Meteorology and Marine Biology. Six of the vessels conducted meridional rveys which covered the western portion of the tropical and subtropical Pacific west of 175°E ngitude. The seventh vessel, conducted experimental fishing north of Tahiti and as far east as 40°W longitude. The results of these surveys will be made available at a later date. *Subject eadings:* **1. Operation Equapac 2. Japanese participation in Equapac 3. Pacific Ocean.**—*.Z.S.*

INDIAN OCEAN

12M–123 91.04(267):551.464(267)

†*Snellius-Expedition, 1929–1930, **Snellius Expedition in the Eastern part of the East Indian rchipelago, 1929–1930 under leadership of P. M. Van Riel, Vol. 4, Chemical results;** tables of) oxygen, hydrogen ion, alkalinity and phosphate, by H. Postma. Leiden, E. J. Brill, 1959. 5 p. Almost entirely tables. fig., 8 refs. Also, **Vol. 2, Oceanographic Results, Pt. 8, Chemi-al results and a survey of water masses and currents,** by Hendrik Postma. Leiden, **1958.** 16p. tables, 24 figs., 51 refs. Added title page for series in Dutch. **DLC** (Q115.S6)—These eports contain an extensive discussion of the methods used and the reliability of the data athered by the Snellius Expedition, 1929–30. Together with recent information it is used to ace water movements in and around the East Indian Archipelago. Two important features are onsidered; the predominant water movement from the Pacific to the Indian Ocean quantitatively e most important water transport, and water renewal within the basins. The influence of the acific is largely caused by the bottom configuration of the area. There is a loss of oxygen during e transport from north to south. The distribution of the pH follows that of oxygen. The ecific alkalinity increases toward the Indian Ocean; due to solution of lime at depth in the asins. The distribution of specific alkalinity in the water masses and water renewal in the asins confirms the supposition that heat flow from the earth's crust must play an important role this connection. Abundantly and well illustrated. *Subject Headings:* **1. "Snellius" Expedi-on, 1929–1930 2. Water mass movements 3. East Indian Archipelago. I. Van Riel, . M. II. Postma, Hendrik.**—*E.Z.S.*

12M–124 91.04(265):551.46(265,267)

Scripps vessel sails for a 2-year study. *Science,* Wash., D. C., 130(3368):151–152, July 7, **1959. DLC**—The expedition is to conduct oceanographic and marine biological surveys of e Gulf of Thailand and South China Sea, particularly with a view to assessing potential food esources of the area, and to train scientists from several southeast Asian countries in the tech-ques of oceanography. It is under the auspices of the Thai and Vietnam governments and U. S. nternational Cooperation Administration and is led by Anton Bruun, Danish zoologist. *Subject eadings:* **1. Oceanographic expeditions 2. China Sea 3. Gulf of Thailand.**—*I.S.*

12M–125 551.46:06(593)

Penyapol, A. (*Royal Thai Navy, Thonburi, Thailand*), **Report on oceanographic surveys arried out in the Gulf of Thailand during the years 1956–1957.** *Pacific Science Congress, h, Bangkok, 1957, Proceedings,* Vol. 16, pub. **1958.** p. 114–123. 4 figs., 2 tables. **DWB** M(06) P117p)—This report which is, in part, in narrative form contains general information of eanographic surveys carried out by the Hydrographic Department of Thailand during 1956–957. Some hydrographic studies since 1856 are mentioned briefly. Information is given on the ree survey areas, the vessels used, the type of data obtained, the equipment and methods of servation and the processing of data. Maps of the survey areas, the stations, cruise routes and rface salinity data are included. *Subject Headings:* **1. Oceanographic surveys 2. Gulf of hailand.**—*E.Z.S.*

ARCTIC

12M–126 551.5:551.46(47):061.3

Burkhanov, V. F., **O novykh issledovaniiakh sovetskii uchenykh v Arktike.** [New in-estigations by Soviet scientists in the Arctic.] *Vsesoiuznoe Obshchestvo po Rasprostraneniiu olitichesikh i Nauchnykh Znanii,* Moscow, Ser. 3, No. 7, **1955.** 23 p. 4 figs., map. **DLC** H39.V8)—An informative account of meteorological (upper air) and oceanographic (current and ift) observations and studies in the Central Arctic Basin during the past few years (to 1955) ith photographs and charts showing drift currents, routes of "Sedov," "Fram," "Jeanette," SP1, SP2, SP3 and SP4 drifting stations (1948–1955). *Subject Headings:* **1. Soviet A explorations 2. Soviet drifting stations SP1-4 3. Central Arctic Basin.**—*M.R.*

12M–127 551.506.5(98):551.513.1:551.465

Frolov, V. V. and Pasetskiĭ, V. M., **Tsentr issledovaniĭ Severnogo Ledovitogo ok** [A center of Arctic Ocean explorations.] *Priroda,* Moscow, No. 8:56–62, Aug. **1958.** 7 **DLC**—The development and scope of Soviet investigations of the Arctic since the establish of the Arctic Scientific Institute which takes its origin in the Northern Scientific-Indu Expedition organized in 1920. This expedition gave rise to the All-Union Arctic Institute. extent of the expeditions by ship and airplane in the Arctic Ocean and the various Northern (Kara, Laptev, Okhotsk, etc.) and the resulting geographical, hydrological, oceanographical, orological and geological accomplishments during the period 1920–1958 are discussed. I next seven years 20 scientific expeditions are planned annually and their purpose will be to im the method of forecasting the navigability of the Northern Sea Route, to develop long (8–10 months) forecasts of ice conditions in Arctic waters, to study the dynamics of waters and the laws of the atmospheric circulation, to develop long range forecasts of the a pheric circulation and associated thermodynamic characteristics and wind fields, etc. Maps ing the extent to which the Arctic seas have been investigated hydrologically, the number o tions per square 30′ in latitude and 2° in longitude during the period 1878–1957, and the pos of radio buoys in March 1958 and a diagram of a radio buoy are presented. *Subject Head* **1. Soviet Ocean expeditions 2. Northern Seas Expeditions 3. Arctic Ocean.**—*I.L.D.*

ANTARCTIC

12M–128 551.46

Bullivant, J. S. (*New Zealand Oceanog. Inst.*), **An oceanographic survey of the Ross** *Nature,* London, 184(4684):422–423, Aug. 8, **1959.** 2 figs., table. **DWB**—In Jan. 1959 the Zealand Oceanographic Institute carried out a survey of the Ross Sea. Its purpose was to in gate the hydrology, the benthic fauna and the marine sediments in the area. The routin cedures and the special observations made are described. The route taken by the survey *Endeavour* and the stations occupied are shown on a map, and a table giving the coordina the stations, nature of the bottom etc. is presented. *Subject Headings:* **1. Oceanographic su 2. Ross Sea survey 3. New Zealand Oceanographic Institute 4. Ross Sea.**—*I.L.D.*

12M–129 91.04(99):551.46(26

Gordeev, Iu. A., **Gidrograficheskie raboty.** [Hydrographical works.] *Sovetskaia A ticheskaia Ekspeditsiia, 1955–,* [*Materialy*], Vol. 5, issued Leningrad **1959.** p. 114–153. ref. **DLC**—The basic problem for the Second Antarctic Expedition was the broad comp the oceanographic works in the Antarctic sector of the Indian Ocean. The volume of the e tion was considerably reduced due to absence of aviation facilities. The oceanographic consisted of the following: (1) Sounding of depths along whole trip; (2) precise determi of the geographic coordinates for all hydrological, geological, geographic and other types of (3) study of behavior of magnetic compass in the Antarctic conditions; (4) collection o information for navigational facilities, correction of map and tables; (5) study of applicat radar in surveying works and electronic navigational instruments in the Antarctic and (6) s ing of the Antarctic continent. Two deep water echo sounders (CALVIN HUGHES) are use tinuously on board of ship "Ob'" during various trips, listed in the text with definite geog coordinates, determined by astronomic, visual and radar means. Specific attention is given large Romanche Trench (Central Atlantic), which was sounded a few times. Surveys were of the Antarctic shores and many specific characteristics were reported, such as the wide the ocean bottom at the south of Prince Edwards Islands or broad area of icebergs, which permanently grounded and many other oceanographic features. *Subject Headings:* **1. Antarctic expeditions 2. Oceanographic expeditions 3. Antarctica.**—*N.P.S.*

12M–130 551.46.07:629.12:91:

Man, I. A., **Vtoroe plavanie dizel'-elektrokhoda "Ob'."** [The second cruise of the electric ship "Ob'."] *Sovetskaia Antarkticheskaia Ekspeditsiia, 1955–,* [*Materialy*], V issued Leningrad 1959. p. 19–26. **DLC**—The loading of the Diesel-electric ship "Ob'" Kaliningrad port with materials and supplies for the Anarctic expedition is briefly de During 23 days of the trip to Capetown (Nov. 7 to 30, 1956) the scientific personnel was for various duties and in the calibration of instruments for astronomic observations. region of the equator a sounding was made in the Romanche Trench, and was found to b m. On the way from the Capetown to the Antarctic the oceanographic observations wer regularly for mapping of this oceanic section. On Dec. 11 at appreciable distance from the airplane IL-12 dropped maps showing arrangements of ice pack for safe navigation

ast line. On Dec. 12 the "Ob'" reached shore ice. To break a 22 mile channel to Mirnyi
was required to land part of the load on ice and to carry it by tractors to the Mirnyi. The
Ob'" with reduced load finally reached the Mirnyi on Dec. 16. During various short trips
om the Mirnyi for studies of ice conditions and observations of the magnetic field of the
rth the "Ob'" gave assistance to various ships of the Antarctic Expeditions, including a small
apanese ice breaker, locked in the icepack. A special trip was made to Capetown in March
r loads of supply and fuel. Final departure from Mirnyi was made on April 6, 1957. On
e way home the ocean depths soundings were made from the Sheklton shelf to India along
°56′E meridian to Killing Islands and along 88°E meridian to the mouth of the Ganges
000 miles with 49 oceanographic stations). The return trip was made via Colombo, Red Sea,
editerranean Sea and back to Riga (Baltic Sea). *Subject Headings:* **1. Soviet oceanographic
peditions 2. Antarctic expeditions 3. Antarctica.**—*N.P.S.*

12M–131 91.04(99):550.3:551.46:551.5(99)
Maksimov, I. V., **Vtoraia morskaia antarkticheskaia ekspeditsiia.** [The Second Antarctic
ea Expedition.] *Sovetskaia Antarkticheskaia Ekspeditsiia, 1955–, [Materialy]*, Vol. 5, issued
eningrad **1959.** p. 7–18. fig., 8 photos. **DLC**—The second Antarctic Marine Expedition was
nt out in 1956 to continue the work of the first expedition. The major problems of the expedi-
on were concerned with the following: (1) atmospheric processes in the Antarctic and their
fluences on the atmospheric circulation around the earth; (2) basic regularities in zonal distribu-
on of water in the southern oceanic ring; (3) water exchange in the polar regions and other
arts of the ocean; (4) geological structures of the Antarctic Ocean bottom and (5) plankton,
enthos, and micro-organism of the southern polar seas. The main area of the expedition was
e oceanographic investigation between 20° and 90°E longitude. The expedition consisted of
e following 8 scientific groups: oceanometeorological, geological, hydrochemical, hydrobiological,
ophysical, geographic, hydrographic and administrative. The members of each group are listed
the text with indication of their professional standing. The expedition consisted of 65 pro-
ssional men. During this trip (2500 miles) through the Atlantic, South Pacific and Indian
ceans 178 deep water oceanographic studies, over 1400 meteorological observations and 236
rological soundings were made. General scientific work during the trip from Kaliningrad to
e Antarctic is described in detail and illustrated with a map and 8 photographs. *Subject Head-
gs:* **1. Soviet oceanographic expeditions 2. Atlantic Ocean 3. South Pacific Ocean 4.
ndian Ocean.**—*N.P.S.*

12M–132 91.04(99):551.46.07
Herdman, H. F. P., **The voyage of Discovery II, 1950–51.** *Geographical Journal,* London,
18(4):429–442, Dec. **1952.** fig. Discussion p. 441–442. **DWB**—Account of voyage from Ply-
outh May 1950 to Fremantle (Australia) July 6 then around the world in the Southern Ocean
ainly near ice edge. Work mainly oceanographic. *Subject Headings:* **1. Oceanographic ex-
editions 2. Antarctica.**—*C.E.P.B.*

12M–133 910.4(269):551.46.07
Herdman, H. F. P., **The recent voyage of the *Discovery II.*** *Marine Observer,* London,
2(157):152–155, July **1952.** fig. **DWB**—General account of circumpolar cruises in Southern
cean Oct. 1950–Sept. 1951 with a few remarks on weather and ice. *Subject Headings:* **1. Ex-
editions 2. Antarctic Ocean.**—*C.E.P.B.*

12M–134 910.4:551.46.07
Mackintosh, N. A., **Voyage of the *Discovery II.*** *Nature,* London, 169(4289):52–53, Jan.
2, **1952. DWB**—Brief summary of work in 1950–51 in Southern Ocean. *Subject Headings:*
Oceanographic research 2. Antarctic Ocean.

INSTRUMENTS

GENERAL

See also: **Apparatus and methods of oceanography, Pt. 1, Chemical** (Barnes), 12M–1; **Oceanography for Mariners** (Zagrodzki), 12M–3; **Current measurements in coastal waters,** 12M–369; **Study of movement of littoral debris by tracers** (Griesseier), 12M–428; **Luminous tracers for study of coastal materials** (Griesseier), 12M–429; **Recording temperature and salinity by bathythermosalinograph** (Khundzhua), 12M–751.

12M–135 551.46.08:06(47)
Sysoev, N. N., **Developments and future in the oceanographic instrument construction
the USSR.** (In: UNESCO Symposium on Physical Oceanography, Tokyo, Oct. 1955,

Proceedings, pub. 1957. p. 246–250. French summary p. 246.) **DWB**—In the last decade construction of oceanographic instruments has progressed because knowledge gained from engineering, electronics, and hydroacoustics have been applied to the construction and us oceanographic instruments. These ensure rapid accumulation of data and rapid calculatio results. The newest instruments and their uses are briefly described. Among those descr are the use of radar and submarine TV, seismic investigations, bottom samplers and devices studying physical and chemical properties of water. *Subject Headings:* **1. Oceanographic ins ments 2. U.S.S.R.**—*E.Z.S.*

12M–136 551.4

Vine, Allyn C. (*Woods Hole Oceanographic Inst., Mass.*), **Some trends in oceanogra instrumentation.** (In: *UNESCO Symposium on Physical Oceanography,* Tokyo, Oct. 1 **Proceedings, pub. 1957.** p. 49–52. fig., 10 refs. French summary p. 49.) **DWB**—A nu of oceanographic instruments are described. The echo sounder is gaining wide use as a precision technique. A new electrical conductivity meter for shipboard and laboratory use been made at Woods Hole. Buoyant floats are used to replace cables. Anchored buoys been placed in 4000 to 5000 m of water to serve as fixed points in survey work and to test durability in heavy weather. Current measurements with surface floats are discussed. An e is being made to telemeter oceanographic or meteorological information from drifting b Desirable design features for research vessels are listed. *Subject Heading:* **1. Oceanogra instruments.**—*E.Z.S.*

12M–137 551.

Woods Hole Oceanographic Institution **[Oceanographic instrument development].** tract AF 19(604)-2043, Technical Report [unnumbered], Dec. 8, 1956–Nov. 29, 1957, pub. **1957.** 4 p. 11 figs. **DWB** (M08.26 W894te)—The development of an airborne radiation mometer, temperature sounding equipment, water sample bottles and a bottom corer are menti Investigations undertaken on ice cover of Lake Angiussaq in north Greenland, analysis of under the ice cover, radiation and albedo measurements, etc. are outlined. Line drawing equipment are shown. *Subject Headings:* **1. Oceanographic instrument development 2. Angiussaq, Greenland.**—*M.R.*

BATHYTHERMOGRAPHS AND BATHYTHERMOMETERS

12M–138 551.46.077:551.508.29:551.4

Rinenberg, E. I.; Shenderovich, I. M. and Plakhotnik, A. F., **K. voprosu ob usoversh vovanii batitermografa.** [The problem of improving the bathythermograph.] *Lenin Nauchno-Issledovatel'skiĭ Institut Gidrometeorologicheskogo Priborostroeniia, Trudy,* No. 5 137, 1957. 7 refs. **DWB, DLC**—The defects and advantages of the Soviet bathythermo model TB–52 are itemized and this model is compared with the instrument constructed i U. S. by The Bristol Company. A new experimental bathythermograph constructed on the of the TB–52 is described. The thermal compensator is eliminated and the recording arr attached directly to the free end of a helicoidal spring which is in the framework of the i ment. The winding of the capillary tube on the framework is multilayered so that its leng halved. The registering arrow is lamellar. In order to make the arrow very flexible its ness is 0.2 mm and the needle of the pointer is thinner than that in the TB-52. The prop of the lubricant for covering the glass of the bathythermograph are described. The resul the tests with the new bathythermograph under laboratory conditions are discussed. *Subject ing:* **1. Bathythermographs.**—*I.L.D.*

12M–139 551.46.077:551.46.087:551.

Shenderovich, I. M. and Kleban, L. S., **Avtomaticheskii batometr-termobatigraf.** [matic bathymeter-thermobathygraph.] *Leningrad. Nauchno-Issledovatel'skiĭ Institut Gidro orologicheskogo Priborostroeniia, Trudy,* No. 7:116–121, **1959.** 3 figs., 2 refs. **DWB, D** The automatic bathymeter thermobathygraph consists of four units: a thermal unit, a unit, a bathymetric unit and an overall case. The bathymetric part of the apparatus consis 8 vessels for collecting samples from 8 different horizons, levers with springs and attached t overall case and a drum with eight bushings of varying length fastened to the depth unit. displacement of the ends of the depth unit by hydrostatic pressure is used to close the vess given standard horizon. The construction and operation of the instrument and of the multiplier are described with the aid of a diagram and photographs. The technical properti this automatic bathymeter thermobarograph are as follows: the temperature of the water c recorded from —2° to +30°C to a depth of 200 m; samples can be collected at standard ho om 10 to 200 m; the mean square error of the temperature is ±0.2°C; the mean square error depths to 30 m is ±1 m; above 30 m it is ±3% of the measured depth; the error of the epth of water sampling is ±(1.5 m ±3% of the standard depth at which the sample is taken); c. The results of tests made with this instrument under laboratory and field conditions are esented. *Subject Heading:* **1. Automatic bathymeter thermobathygraphs.**—*I.L.D.*

12M–140 551.46.087

Shenderovich, I. M. and Plakhotnik, A. F., **Usovershenstvovannyĭ batitermograf.** [Im-oved bathythermograph.] *Leningrad. Nauchno-Issledovatel'skiĭ Institut Gidrometeorologiches-)go Priborostroeniia, Trudy,* No. 7:122–131, **1959.** 4 figs., 4 tables, 7 refs., 7 eqs. **DLC, DWB** -The author attempts to clarify the responsibility of the instruments for the hysteresis of the cord of the improved TB-52 bathythermograph designed for marine experiments and to present easures for reducing the operational part of the hysteresis of the record. The results of labora-ry tests show that the inertia of the thermal system of the TB-52 bathythermograph is rather nall (of the order of 0.3 sec) and is fully suitable for this instrument. This inertia does not ceed the inertia of instruments made abroad. The inertia can be reduced by increasing the ecific surface of the temperature sensing liquid (toluol). The principle cause of the hysteresis to be found in the depth unit. The procedures for testing the causes of hysteresis in the ermal and depth units are described. With the aid of illustrations the author describes the onstruction of the modified bathythermograph. Illustration of the thermal and pressure unit are esented. Equations are derived for calculating the lowering and raising of the bathythermo-aph in the temperature jump layer (m/sec) thereby obtaining minimum divergence in the cord because of the thermal inertia of the instrument. *Subject Heading:* **1. Bathythermo-raphs.**—*I.L.D.*

12M–141 551.46.087:621.315

Snodgrass, James M. and Cawley, John H., Jr., **Bathythermometer telemeters ocean data.** *lectronics,* N. Y., 30(5):142–145, May 1, **1957.** 7 figs. Reprinted as *California. Univ. cripps, Institute of Oceanography, Contributions, 1958,* issued **1959.** p. 697–702. **DWB** (551.46 153co 1958)—Two-unit transistorized system lowered from the ship gives plot of temperature gainst depth. Absolute accuracy in depth is better than ±0.25% and temperature sensitivity of 05°C can be obtained. Vibrating wire transducer and thermistor Wien-bridge oscillator provide epth and temperature data, respectively. *Subject Heading:* **1. Bathythermometers.**—*Authors' ummary.*

12M–142 551.46.08(268)

Zalogin, B. S. and Edel'man, M. S., **Primenenie batitermografa v arkticheskom more.** Use of the bathythermograph in the Arctic sea.] *Meteorologiia i Gidrologiia,* Leningrad, No. :58–61, April **1959.** 4 figs., table. **DWB, DLC**—The author demonstrates the possibility of sing the Soviet manufactured bathythermograph "TB–52" from a moving vessel in the Arctic a. A total of 41 bathythermographs were made including 9 from a moving vessel; simultane-usly a reversing thermometer was used. The procedure for carrying out comparative measure-ents simultaneously, water temperatures from a vessel with a bathythermograph and reversing ermometer which were lowered by means of an electric and a hand winch respectively, from the de of the vessel while standing and in motion are described. The results of the comparative easurements are presented in graphs and in a table. In the case of stationary positions a satis-ctory agreement was indicated between the readings of the bathythermograph and the thermometer; e mean difference in readings was 0.13°–0.18°C. It is shown that when the bathythermograph used with a moving vessel it is not necessary to extropolate the table of the "Handbook" for nall depths. The results of the study demonstrate that the bathythermograph can be used in rctic waters to obtain a true picture of the structure of the layer of the temperature jump. *ubject Headings:* **1. Oceanographic instruments 2. Bathythermographs 3. Arctic Ocean.**—*L.D.*

DENSIGRAPHS

12M–143 551.46.083:551.463/4:531.756

Føyn, Ernst (*Univ. Inst. for Marin Biologi, Oslo*), **Hydrographic and biological investiga-ons in Oslofjord by means of the densigraph and the oxymeter.** *Journal of Marine Research,* ew Haven, Conn., 17:174–177, **1958.** 3 figs., 3 refs. **DWB, DLC**—Brief descriptions of the ensigraph and the oxymeter are followed by notes on the use of these instruments in Oslo Fjord. he densigraph (Føyn, 1953) measures density *in situ,* by means of a balancing liquid and connect-g tubes. The level of the liquid is photographed continuously on a plate that is moved by water ressure as the apparatus descends. The plate, when developed, then provides a curve that shows e variations in density with depth. The oxymeter (Føyn, 1955) which measures the oxygen content of water electrically, is fitted with an insulated cable that is connected to a recorder on boat. The oxygen curve is recorded directly on paper that is moved by electrical pulses the meter wheel. This instrument provides a continuous oxygen curve as it moves down an through the water. It is thus possible to determine the depths which may be of special int in hydrographic and biological work. Density and oxygen curves obtained in Aug. 1954 at stations in the fjord are illustrated. The relations of these conditions to biological conditions mentioned. *Subject Headings:* **1. Densigraphs 2. Oxymeters 3. Oslo Fjord, Norway.**—*E*

12M–144 551.46.083:551.463/4:53

Cox, Roland A., **An improved salinity and density meter.** *International Council fo Exploration of the Sea, Copenhagen, Journal,* 23(1):38–46, **1957.** 3 figs., 3 tables, 2 refs. I Reprinted as *National Institute of Oceanography, Wormley, Surrey, England, Collected Rep* 6(220), Dec. **1958. DWB**—Improvements have been made on the float-type salinity meter. all-glass float has been replaced by one incorporating metal springs, and the mechanical design been modified to increase speed of operation. The precision of the apparatus is still approxim equal to that of the standard chemical method. Details and dimensions are given for the struction of floats to cover any desired range of salinity, and for computing the necessary s An artificial density standard suitable for approximate work is described. *Subject Head* **1. Oceanographic instruments 2. Salinity meters 3. Density meters.**—*Author's synopsis*

12M–145 551.46.083.7:621.396:55

Huebner, George L., **Note on radio frequency salinity measuring equipment at T A. & M. College.** *National Research Council, Wash., D. C., Publication,* No. 600, **1959.** p. **DWB** (551.4601 C748co)—A brief note on the improved conductivity type instrument elimin fouling by use of a "Twin-T" type bridge operating at 10 Mc which prevents any active elec metallic contact with the sea water sample under measurement. Accuracy of salinity deter tions are about .005% with a difference determination between samples of .001%. The in ment was developed from earlier instrumentation constructed at this college. *Subject Hea* **1. Salinity measurement equipment.**—*W.N.*

12M–146 551.464.5:5

Miyake, Y.; Saruhashi, K. and Kameda, K. (*all, Met. Res. Inst., Tokyo*), **Micro-anal method and automatic potentio-metric titration method for the chlorinity determina** (In: UNESCO Symposium on Physical Oceanography, Tokyo, Oct. 1955, **Proceedings, pub.** p. 43–45. 4 figs., table, 2 refs. French summary p. 43.) **DWB**—By using the micro-an method as described, there is a saving, in time, amount of reagents used, and amount of samples used. The results are within allowable limits of accuracy. The automatic potentio titrator as described gives results which compare favorably with previous methods. Each tit requires only about five minutes. *Subject Headings:* **1. Chlorinity determinations 2. matic potentiometric titrator.**—*E.Z.S.*

12M–147 551.46.083:5

†Paquette, Robert G., **Salinometers.** *National Research Council, Wash., D. C., Public* No. 600, **1959.** p. 128–145. 3 figs., table, 34 refs. **DWB** (551.4601 C748co)—The disc is concerned with a number of salinometers presenting promising principles of reliable me ments. The principal sources of error and ways to avoid them are summarized. The instru considered are: one for density measurements, a remote-indicating instrument, an automatic ti and a modification of the Wenner-Smith-Soule salinity bridge. The latter is shown in a diagram. Salinity bridge errors are tabulated for comparison and data on accuracy are gi the descriptive text for each instrument discussed. *Subject Headings:* **1. Salinomete Salinity bridges 3. Titrators.**—*W.N.*

12M–148 551.46.083:

Ponsov, A. G., **Opyt primeneniia magnitnykh meshalok pri titrovanii morskoĭ** [Experiment on the use of magnetic stirrers to titrate sea water.] *Meteorologiia i Gidro* Leningrad, No. 4:52–54, April **1959.** 2 figs. **DWB, DLC**—The use of magnetic stirr titrate sea water which is described by the author invalues considerable difficulties, esp when using the magnetic stirrers manufactured by the Experimental Instrumental Shop A. A. Bogomoletz Laboratory of Physiology of the Ukrainian Academy of Sciences. Their consist of their large size, the need for additional construction to fasten them in ship labor and the need for separating the cylindrical magnet from the AgCl precipitate on completion titration. With the aid of diagrams the author describes a special support that eliminates difficulties. The titration is rendered rapid and uninterrupted if the cylindrical magnet aken out of the glass by bringing a permanent magnet or an electromagnet under the glass at ne moment the silver chloride and water are poured out of the glass. The attachment of the upport magnetic "trap," the operation of the stirrer, etc. are described. *Subject Headings:* **1. ea water titration instruments 2. Magnetic stirrers.**—*I.L.D.*

SALINITY METERS

12M–149 551.464.5:543.25:551.46.083.7

Pritchard, Donald W., **The *in situ* measurement of "salinity" with the induction-conuctivity indicator and comments on the use of sound velocity for *in suti* measurements of salinity."** *National Research Council, Wash., D. C., Publication,* No. 600, **1959.** p. 146–154. g., 2 eqs. **DWB** (551.4601 C748co)—The electrodeless ICTI unit discussed is also presented in schematic diagram showing the conductivity sensing element. Conductivities to ±0.2 millimoh ver the entire range of temperature (to ±0.02°C) in estuarine and marine environment, down to bout 1000 ft depth were measured. The Greenspan Sound Velocity Meter is restricted to about :1 ft/sec by modifications in process. For the time being, the accuracy of *in situ* determinations f salinity by the induction method appears more promising. *Subject Headings:* **1. Salinity measrements 2. Salinometers 3. Sound velocity meters.**—*W.N.*

12M–150 551.464.5:551.46.083.7

*Rotschi, Henri (*Maire de recherches à l'O.R.S.T.O.M. Océanog. à l'Inst. Français d'Océanie*), **ur l'emploi du salinomètre australien du C.S.I.R.O.** [Use of the salinometer of the Ausalian C.S.I.R.O.] *France. Comité d'Océanographie et d'Etudes des Côtes, Cahiers Océanoraphiques,* 11(8):592–601, Sept./Oct. **1959.** 2 figs., 5 tables, 3 refs., eqs. **DLC, DWB**—From Nov. to 3 Dec. 1958, 37 stations were visited by "Orsom III," the research ship of the French nstitute of Oceania and 12 water samples at different levels were collected at each station. The alinities were determined on board with a salinity bridge of the C.S.I.R.O. They were then etermined ashore by the Knudsen method. Then each sample was measured successively on each f the two bridges of the C.S.I.R.O. This paper presents a statistical comparison of the reliaility and precision of salinity bridges with the Knudsen method practiced by French Institute of Oceania, and that adapted by STRICKLAND. *Subject Headings:* **1. Salinity determination 2. alinity bridges 3. Salinometers**—*I.S.*

12M–151 551.464.5:543.24:551.464.083.7

Sabinin, K. D. and Gamutilov, A. E., **Opyt primeneniia laboratornogo interferometra TR-2 dlia opredeleniia morskoĭ vody.** [An experiment in the application of the ITR-2 laboraory interferometer for the determination of the salinity of sea water.] *Meteorologiia i Gidroogiia,* Leningrad, No. 5:51–54, **1958.** 2 figs., table. **DWB, DLC**—The principles underlying the se of an interferometer and the diffraction phenomenon to determine the salinity of sea water re described. Light passes through the openings of two diaphragms; the upper part of the light ays passes through a two-chambered curvette with a standardized solution and the unknown soluon, while the lower part passes under the curvette into distilled water of the thermostat chamber f the apparatus. Owing to differences in the refraction indices of the unknown and standard olutions the upper interference pattern is displaced relative to the fixed lower pattern. By upper terference zones relative to the lower on the difference between refraction indices of the standrd and unknown solutions is determined. The interferometer is calibrated by parallel analysis of amples of sea water by means of the interferometer and titration with chlorine and establishing a alibration curve. The ITR-2 fluid interferometer is illustrated by means of a photograph and ne calibration procedures employed on the "Vitiaz" is outlined. Out of 131 parallel interferometer nd titration determinations 80 were used to construct a calibration curve. A correlation coefficient f $r = -0.992 \pm 0.001$ and a regression equation of $S = -0.00240n + 34.976$ were obtained. he mean theoretical error of salinity computed with the operation was $E_s = \pm 0.013\%$. The rrors of titration rarely exceeded ± 0.02%. The source of large errors was the inadequate retenon of the curvette in the thermostat so that the temperature in division of the curvette could be neven. The maximum errors of the interferometer may be ± 0.036%. Graphs giving the relaonship of readings on the interferometer to titrations of salinity, and curves of probability of eviations of interferometer readings from titration, are presented. *Subject Headings:* **1. Salinity easurement 2. Interferometers.**—*I.L.D.*

12M–152 551.46.085

Young, Leslie and Wilson, G. (*Natl. Eng. Lab., Cast Kilbridge, Glasgow*), **Developments in alt-velocity flow measurement.** *La Houille Blanche,* Grenoble, 15(5): 569–600, Sept./Oct. **1960.** 0 figs., 2 tables, 7 refs. English and French texts. French and English summaries p. 569. **DLC**—An extensive series of laboratory experiments, supplemented by field tests, has been made

on the salt-velocity method of flow measurements. Comparative flow measurements were made
a standard weighbridge in the laboratory, and by current meters in the field tests. Novel app
tus has been constructed which is small and light for easy transport in field work, which g
satisfactory results in water of high initial conductivity, and which can be operated in pipe l
under high heads. Rapid methods of analyzing the observations have been developed, and a
result it has been found possible to design completely battery-operated detection equipment w
should give virtually instantaneous measurement of flow. The laboratory equipments showed t
subject to certain limitations, the apparatus gave results with 95 per cent confidence limits
error of ± 1 per cent. The field tests appear to confirm this. *Subject Headings:* **1. Flow m**
urement techniques 2. Current meters 3. Salt-velocity flow measurement technique
Authors' abstract.

12M–153 551.46

Ramandham, R. and Murty, A. V. S. S. (*both, Andhra Univ., Waltair, India*), **Contin**
measurement of sea surface temperature. *International Oceanographic Congress, 1st, N*
1959, Preprints of abstracts of papers. Issued Wash., D. C., AAAS, **1959.** p. 564–566. 3
DWB (551.46082. I61pr)—Since there was no instrument in India to make a continuous re
of temperature the authors developed a thermistor thermometer for the purpose. Features of
thermometer are described and graphically illustrated. An "F" type thermistor manufacture
the Standard Telephones and Cables Limited is used in this instrument. *Subject Headings*
Oceanographic instrument design 2. Sea surface temperature measurements 3. Therm
thermometers 4. India.—*I.S.*

12M–154 525.6:551.465:551.

Selitskaia, E. S., **Nekotorye vozmozhnosti vyiavleniia kolebanii temperatury vo**
prilivnym periodom. [Some possibilities of analyzing water temperature oscillation with a
period.] *Meteorologiia i Gidrologiia,* Moscow, No. 9:36–38, Sept. **1959.** 3 figs., ref. D
DLC—The author presents a method for using forecasts of tidal oscillations of level to for
the tidal oscillations of sea water temperature. It is based upon a tidal forecasting proc
developed by A. I. DUVANIN (*Moscow. GOIN, Trudy,* No. 30, 1955). The astronomical fa
determining tidal height, namely deviations of sun and moon, angles of sun and moon and dis
from the center of the earth to the sun, are replaced by a single astronomical indicator, i.e
culmination of the moon, which is expressed in the form of a scale N; the distance betwee
earth and moon is neglected. For the same value of N the tidal amplitudes and phases s
be similar. An analysis of vertical transport during the mixing of water under the infl
of tides was carried out during the summer since the vertical temperature jump is very m
at this time. Data for the North Sea and the Danish Straits were used. A graph of N ag
hours was set up and at the intersection of suitable coordinates the hourly values of temper
for a given day were plotted; these served as the basis for isolines of mean values and
isolines separated zones of positive and negative temperatures. The graph obtained show
regular alternation of the rise and fall of tidal waters and that during analogous periods
similar values of N temperatures show similar behavior. The diurnal variation of temper
at the 35 meter horizon averaged 5°C. A similar analysis is presented for Nord Trindel i
Danish Straits. *Subject Headings:* **1. Sea water temperature variations 2. Ocean tide H**
variations 3. Danish Straits 4. North Sea.—*I.L.D.*

12M–155 551.46.062.5:551:

Holser, W. T., **Methods of measuring the thermodynamic properties of sea water at**
pressure. *National Research Council, Wash., D. C., Publication,* No. 600, **1959.** p. 16
2 figs., table, 13 refs. **DWB** (551.4601 C748co)—The tabulated data for sea water and
solutions clearly indicate lack of determination of (1) density of sodium chloride solutio
one atmosphere and (2) its measurement to 1000 bars at temperatures other than 25°C as w
(3) comparison of sea water with pure water. Several methods are considered, such as: ele
dilatometric, the volumometer method, acoustic velocity methods, etc., none of which involve
difficulty greater than that of finding an interested researcher to conduct the measurements.
ject Headings: **1. Sea water properties 2. Sea water analysis 3. Marine thermody**
properties.—*W.N.*

12M–156 551.46.087:551.

Kolesnikov, A. G.; Panteleev, N. A.; Pyrkin, Iu. G., et al., **Apparatura i metodika**
tratsii aturbulentnykh mikropul-satsii temperatury i skorosti techeniia v more. [App
and method for recording turbulent micropulsations of temperature and current speed in the
Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz., No. 3:405–413, March **1958.** 11 figs., (

hoto), 7 refs. Transl. into English in the corresponding number of the *Bulletin of the Academy f Sciences, USSR, Geophysics Series.* **DWB, DLC**—The authors describe the construction and se of an apparatus designed to record continuously temperature of water and the velocity of urrents, and also the pulsational components such as the horizontal and vertical components of elocity, and the pulsations of water temperatures in the sea. It is suitable for work from a ationary position not subject to pitching. The paper includes the following: a review of the resent status of the problem of measuring temperature of water and current velocities in the ceans; the requirements that new apparatus must meet; namely all elements, intensifier and ecorder, must have a constant time no greater than 0.1 sc., that the temperature must be measred with a precision of the order of 0.001–0.005°C, etc.; a description of the apparatus for ecording turbulent micropulsations—turbulent marine meter TM-1 (illustrated by diagrams and photograph); the construction and calibration of the marine turbulence meter; method of measrement with TM-1; and examples of temperature and current velocity records and results of eir analysis are presented. *Subject Headings:* **1. Ocean water temperature micropulsation easurement 2. Ocean current velocity micropulsation measurement 3. Marine turbulence eters. I. Petrov, V. P. II. Ivanov, V. V.**—*I.L.D.*

12M–157 551.46.078
Gurbanidze, Sh. A., **Novye pribory—bex ucheta dostizhenii tekhniki.** [New apparatus—ithout consideration of technical advances.] *Meteorologiia i Gidrologiia,* Leningrad, No. 4:52, uly/Aug. 1955. **DWB**—The author deplores the lack of suitable apparatus for obtaining water amples which carry alluvium and describes the characteristics of various bathometers (modificaon of the Zhukorski bathometer). *Subject Headings:* **1. Ocean water samplers 2. Bathomeers.**—*I.L.D.*

12M–158 551.46.078:551.46.018
Nan'niti, T. (*Met. Res. Inst.*) and Iwamiya, M. (*Thurumi Seiki Co.*), **A new plastic water ampler.** *Papers in Meteorology and Geophysics,* Tokyo, 5(1):95–96, April **1954.** 2 figs., ref., eqs. **DWB**—A new plastic water sampler is described. The instrument is lowered to the equired depth head forward, the tube at the upper end and the sampler is in open position. In to 5 min., the thermometer reaches the temp. of its surroundings. The water temp. can be measred by reading the thermometer through the tube. *Subject Heading:* **1. Ocean water samplers.** –*A.H.K.*

12M–159 551.46:078
Skibko, N. E., **Zakidnoĭ probootbornik.** [A reversing type water sampler.] *Meteorologiia Gidrologiia,* No. 8:50–52, Aug. **1956.** 3 figs. (photos). **DWB, DLC**—A description, with hotographs, of a reversing type water sampler capable of obtaining water samples 5 to 50 cm elow the surface and 10–15 m from the bank. *Subject Heading:* **1. Ocean water samplers.**—*L.D.*

WAVE METERS

12M–160 551.508.94:551.46.018:551.46.086
Afanas'ev, A. N. and Mamontov, I. V., **Volnomernaia vekha na postoiannom osnovanii.** Wave measuring rod on a fixed base.] *Meteorologiia i Gidrologiia,* No. 8:52, Aug. **1956.** fig. **WB, DLC**—The measuring rod proposed to measure various wave elements consists of a conete base to which is attached a tube wherein the measuring rod is inserted. The dimensions of e various parts, their structure and relationships are described with the aid of a diagram. *Subct Heading:* **1. Ocean wave meters.**—*I.L.D.*

12M–161 551.46.086:551.556.8:532.593
Barber, Norman F. (*Dept. Sci. & Indus. Res. Lower Hutt, N. Z.*), **Measuring the directional bectrum of wind waves.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of bstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 740–741. French summary p. 741. **WB** (551.46082. I61pr)—A brief description of an apparatus designed to determine the direconal power-spectrum of wind waves. The motions of a system of floats are used to calculate the rectional spectrum of waves. The apparatus is still in experimental stage and experiments on s use are in progress at Port Nicholson, Wellington, New Zealand. *Subject Headings:* **1. ceanographic instruments 2. Wind wave directional spectrum 3. Floats 4. Wellington, ew Zealand.**—*I.S.*

12M–162 551.46.086
Belkova, E. N., **Volnomer-perspektometr binokuliar.** [Wave meter-perspectometer binocur.] *Leningrad. Nauchno-Issledovatel'skiĭ Institut Gidrometeorologicheskogo Priborostroeniia,*

Trudy, No. 7 :132–146, **1959.** 3 figs., 7 tables, 4 refs., 3 eqs. **DLC, DWB**—The author descri
the construction and operation of a binocular wave meter which is free of the defects of the VB-
wave meter. With this new binocular wave meter it is possible to measure wave heights up to 9
and individual wave elements when the apparatus is set up on the shore at an elevation of 5 to 70
above sea level, i.e., at elevations which are most often encountered in practice. The binocu
can measure in addition to height the period, length, velocity and direction of propagating wa
and also the velocity of floating ice and distances to various objects at sea. The wave elements
determined by means of the optical systems, which consists of a binocular on the basis of sc
division of a special grid placed in the principle focal plane of the objective of the instrume
Velocity of movement of floating ice is measured by means of a limit grid and second measur
The construction of the binocular and of the perspective scales for heights of 10 and 40 m ab
the level of the sea are developed and the results of calculations are presented. The technical d
of the binocular are given. Experimental data collected on land and over water are presented
tables. *Subject Headings:* **1. Binocular wave meter 2. Ocean wave measurement instrume**
3. Floating ice measurements.—*I.L.D.*

12M–163 551.46.

Dreĭer, A. A., **Uskorennyĭ metod obrabotki lent potensiometra.** [A faster method
processing potentiometer tapes.] *Meteorologiia i Gidrologiia,* Leningrad, No. 2:53–54, Feb. 19
DWB, DLC—The author describes a simplified method for reading heights and periods of wa
from potentiometer tapes when the tensometric wave recorder of the State Oceanographic Instit
is used. In order to eliminate errors when extreme points of troughs and ridges do not lie
the grid of the tape imaginary or pencilled lines are drawn parallel to the grid at the ridges
troughs and the distance is measured between them. The spread of the measuring device
applied to the grid of the tape and the distance corresponding to the heights of the waves
obtained in divisions of the tape. The heights obtained are multiplied by a calibration coeffic
and the heights of the waves are obtained in cm. If on a piece of thin plexiglass, a transpa
ruler, for example, a grid repeating the grid of the potentiometer tape is plotted and the divisi
are numbered, it becomes possible to move such a grid and to match it with the wave record.
is also considerably easier and quicker to read off heights from the tape without drawing
imaginary or real lines. Errors caused by slopes of the measuring device are eliminated. Si
the calibration coefficient is known it is possible to compute by putting the grid upon the rule
reading the heights in cm. The periods can be read off similarly. *Subject Headings:* **1. Oc**
wave recorders 2. Ocean wave measurement instruments.—*I.L.D.*

12M–164 551.46.086:53

Glukhovskiĭ, B. Kh. and Vilenskiĭ, Ia. G., **Volnograf otkrytogo moria.** [Wave recorder
the open sea.] *Meteorologiia i Gidrologiia,* No. 12:51–55, Dec. **1956.** 5 figs., eq. **DWB, D**
—The author describes the principle and construction of a wave meter which records visually
without perceptible distortion the spectrum of surface waves, and records both the height
period of successive waves in the open seas. It is based upon the following principles: at
depths exceeding half the length of a wave the surface waves do not influence the magnitud
the hydrostatic pressure. If a pressure recorder be placed at such a depth then its registrat
would be determined by the height of the column of water from the mean sea level to the se
the recorder independently of the condition of the sea surface. In practice, the recorder is atta
to a free floating float or is let down to any specified depth. The float carried along by the w
moves up and down and the reacting element experiences hydrostatic pressure which alters
the wave motion. The exclusion of ballast pressure is compensated by a plastic balloon of g
volume filled with air. Diagrams of the wave meter and of its circuitry are presented, and
results of operation of the wave recorder are given. *Subject Heading:* **1. Ocean wave record**
—*I.L.D.*

12M–165 532.59:551.46

Ikonnikova, L. N., **Ispytanie volnografov i maksimal'nykh volnomernykh reek.** [Tes
of wave recorders and maximum wave measuring rods.] *Meteorologiia i Gidrologiia,* Lenin
No. 2:53–55, Feb. **1957.** 3 figs., 3 refs. **DWB, DLC**—Improvements in the constructio
"Il'men" tube wave recorder are described. Both the old and new model of this device
tested to determine the accuracy with which wave heights and periods were measured.
GOIN wave recorder was used as a standard. The "Il'men" wave recorder, both the old
new model, may be used under any conditions only to measure waves whose mean height
not exceed one m. The mean relative error of measurement in this range of height amount
4–5%. This wave recorder can be used to register steep storm waves when the mean height
not exceed 1 m within the existing errors but also with partial damage to individual contact

this device. A maximum wave measuring rod operating on the principle of the floating wave meter was used to measure the highest crest of a wave. The movement of the float in a vertical plane proceeds along a guiding hawser. A cork placed on the float is pushed by it and held on the hawser by friction at the level of the highest wave crest passing through the rod. Possible defects of the rod are pointed out. *Subject Headings:* **1. Ocean wave recorders 2. Ocean wave measuring rods.**—*I.L.D.*

12M–166 532.59:551.465:551.46.086

*Ishiguro, Shizuwo (*Nagasaki Marine Obs.*), **A method of analysis for long-wave phenomena in the ocean, using hydraulic models and electronic and cybernetic techniques (An electronic system for recording and analysing sea waves, Pt. 2).** *Oceanographical Magazine,* Tokyo, 11(1):21–49, Aug. **1959.** 28 figs. (1 fold.), 6 tables, 2 refs. **DWB, DLC**—A method of analysis for long-wave phenomena in the ocean and the equipment for this method are described. A phenomenon to be analysed is assumed to be a 'response' resulting from an 'excitation' on the 'system,' and the relations between these are analysed. A hydraulic model is used to represent the system, and electronic devices including servo-mechanisms are used to deal with the excitation and the response. By this method, it is possible to deal with long-wave phenomena including the transient states caused by arbitrary excitations on an arbitrary bottom topography. *Subject Headings:* **1. Ocean wave recorders 2. Ocean wave analysis 3. Electronic oceanographic apparatus.** —*Author's abstract.*

12M–167 532.59:551.46.086

Levchenko, S. P., **Opticheskii volnomer-dal-nomer.** [Optical tele-wave measurement.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.,* No. 1:138–140, Jan. **1958.** 3 figs., 2 refs. Transl. into English in the corresponding number of Its *Bulletin of the Academy of Sciences, USSR, Geophysics Series.* **DLC**—With the aid of a photograph and diagram, the author describes the construction of a wave meter which uses the optical system of a short base telemeter and which has a special computing grid-nomogram and two mobile threads in the ocular. This tele-wave meter facilitates measurements of wave heights from vessels at sea where the use of a float or buoy is not possible but the initial calculated values of H (position of wave meter above water surface) and α (angle of inclination of the optical axis of the objective to a horizontal plane) are variable magnitudes owing to the rocking of the boat. The measurement of the length and height of waves with this device is described. *Subject Headings:* **1. Ocean wave recorders 2. Optical tele-wave meters.**—*I.L.D.*

12M–168 551.465:532.59:551.46.086

Nakano, Masito (*Ocean. Lab. Met., Res. Inst., Tokyo*),**A wave recorder and a wave analyzer recently devised in the Oceanographic Laboratory Meteorological Research Institute, Tokyo.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 774–776. German summary p. 776. **DWB** (551.46082. I61pr)—A brief description of a new wave recorder (MK-Mark II) and a new wave analyzer (MERIAC-1-F). These were recently designed and built by T. Furuhata of the Wave Research Group in cooperation with all the members of the group. The recorder is a shore-based electric wave gauge consisting of an underwater unit, of a submarine cable and of a self-recording apparatus and is very suitable for observing ocean waves continuously over a long period of time. The wave analyzer, electrically transmits wave records to a forecast center and analyzes the wave spectrum there immediately after the completion of the wave observation. *Subject Headings:* **1. Ocean wave recorders 2. Ocean wave analyzers.**—*I.S.*

12M–169 551.46.086:551.466.2:778.38

Pugin, A. A., **Novoe v metodike stereofotogrammetricheskoĭ s"emki volneniia.** [News in the method of surveying waves stereophotogrammetrically.] *Vsesoiuznyĭ Gidrologicheskiĭ S"ezd, 3rd, Oct. 1957, Trudy,* Vol. 4, issued**1959.** p. 127–133. 3 figs. **DWB** (M79 V985tr)—Methods of stereophotogrammetry and aerial photogrammetry for observing waves are described. In the static method, two remote-controlled aerial photographic cameras are situated on the shore. Aerial methods include low altitude flights with one plane and two cameras; high altitude flights with two planes each carrying one or two cameras. In the latter case, three cameras photograph the wave surface, the fourth camera photographing the first plane. Figures and formulas illustrate detailed discussions of the methods. Similar methods of U. S. Hydrographic Institute are mentioned. *Subject Headings:* **Ocean wave observations 2. Stereophotogrammetry of ocean waves 3. Aerial photographs of ocean waves.**—*J.N.*

12M–170 532.59:551.46.086

Rzheplinskiĭ G. V., **Nekotorye osobennosti rezul'tatov volnografnykh nabliudenii v okeane.** [Some peculiarities of the results of wave-recorder observations in the ocean.] *Meteorologii i*

Gidrologiia, Leningrad, No. 1:44–46, **1958.** fig. **DWB, DLC**—As a result of the absence
shores and the almost unlimited run of waves in the storm zone of the Antarctic sector of
Indian Ocean, surges and wind waves are almost always present. The situation is similar in
trade wind zone of the Indian Ocean except that the surge and wind waves are almost always
the same direction. Under such conditions the heights and periods of waves measured by
wave recorder in the ocean are not related directly to the actual wind since in almost all ca
the wind waves are accompanied by surges. Hence, the direct results of wave recorders in
ocean can only in rare instances be used to verify the theoretical calculations of wave eleme
The author analyzes the record of a wave recorded as an example involving a large surge an
considerable wind wave. It is shown that the profile recorded by the wave recorder does
correspond to the real profile of the wave disturbed surface as obtained by a stereogrammetric
and does not indicate the presence of wind waves whose height is of the same order as that of
surge waves. The wave recorder could indicate the presence of two wave systems and an act
profile of a wave disturbed surface only if both wave systems have a uniform group velocity
spread. Accordingly when surges occur together with wind waves the latter, having a lo
velocity, are occasionally fixed on the most sloping parts of ridges and troughs of waves registe
by the wave recorder as fundamental occillations of the wave level. In relation to the princ
oscillation of wave level at a point these waves are secondary and are excluded from considerat
However, in relation to the areal characteristic of diverse waves these waves may have considera
size. They are secondary only in relation to their speed. Since at a given point the wave recor
cannot provide a true picture of a wave field visual observations of waves should be made para
with wave-recorder measurements. *Subject Headings:* **1. Ocean wave analysis 2. Ocean w
recorders 3. Indian ocean.**—*I.L.D.*

12M–171 532.59:551.46.

Rzheplinskiĭ, G. V., **Printsipal'nyĭ nedostatok turbinochnogo volnografa i metodika ob
botki volnogramm.** [Principal deficiency of the turbine wave recorder and the method of wo
ing up the wave graph.] *Meteorologiia i Gidrologiia,* Leningrad, No. 3:53–55, March **1958.**
2eqs. **DWB, DLC**—The principal defect of the VOM-50 wave recorder lies in the fact
the system of float and the attached cable drifts under the action of currents having the grea
velocity at the surface of the sea; also strong winds drag the wave recorder. Hence, the f
moves relative to the quieter deep water level where the turbine is located so that the latter sh
from its vertical position. The additional drift velocity added to the movement of the turb
increases the height of individual waves and the mean heights of waves on the leeward side
slopes of ridges and diminishes them on the windward side. Accepted methods of introdu
corrections for this drift in the wave meter graph are not adequate. Because of the drift of
float, the increase in the height of the leeward and windward slopes of the waves is in an appr
mate ratio of 3:1 and that individual corrections for the drift should be proportional to
periods of the waves the following correction is proposed:

$$+K_{i,1} = \frac{\Delta z_N \tau_i}{4\sum\limits_{1}^{N} \tau}$$

$$-K_{i,2} = 3K_{i,1}$$

where $+K_{i,1}$ = magnitude of the correction to be added to the height of the windward slope of a gi
wave, Δz_N = difference between the sums of the heights of the slopes of the windward and leew
slopes N of succeeding waves, τ_i = period of a given wave, $\sum\limits_{i}^{N} \tau$ = sum of the periods $N_i K_{i,2}$ = m
nitude of correction to be added to the height of the leeward waves. The results of the use of th
corrections are discussed. *Subject Heading:* **1. Ocean wave recorders.**—*I.L.D.*

12M–172 551.46

Snodgrass, Frank E. and Putz, Robert R., **Wave height and frequency meter.** *Internati
Conference on Coastal Engineering, 6th, Univ. of Florida, Dec. 1956, Proceedings,* issued (195
p. 209–224. 8 figs., table, 19 refs. Reprinted as *California. Univ. Scripps Institution
Oceanography, Contributions,* 1958, issued **1959.** p. 471–486. **DWB** (551.46 C153co 1958
During World War II a group of Naval officers conducted visual measurements of ocean wa
simultaneously with instrumental recordings. A comparison of the visual and instrumental va
indicated ". . . the natural tendency for the observer . . . to record not the average wave he
but a wave height based on some kind of average of the highest waves. The general experie
is that an observer will give a value for the wave height which represents the average of

ighest 20 to 40 percent of the waves" (SIO, 1944). The average height of the highest one-third of the waves, $H_{1/3}$, was therefore suggested as the characteristic (or significant) wave height. 'Characteristic wave period" was given a corresponding definition as the average period of the ighest one-third waves. An interpretation of characteristic wave height in terms of standard tatistics was made by PUTZ (1952) and LONGUETT-HIGGINS (1952) (*see* 4.9–143, Sept. 1953 *Met. Abs.*). They related theoretically "rms" height, mean absolute ordinate a_0, and the average eight of the highest "p" percent. It turns out that $H_1 = 5.02a_0$ Underlying assumptions are hat the ordinates are Gaussian and the spectrum moderately narrow. A summary of observations elating to statistical properties of wave heights was recently made by WIEGEL and KUKK (1957) (*see* 9D.157, April 1958, *Met. Abs.*). Measurement of the average absolute ordinate can easily be accomplished. In this paper two systems are described which lead to a direct measurement of $5a_0 \, (= H_{1/3})$. The overall situation is therefore satisfactory inasmuch as a naturally reported uantity, the characteristic wave height, can be defined in terms of fundamental statistics and bjectively recorded by automatic means. The situation is not nearly as satisfactory with regard o wave period. The original definition of characteristic wave period of the highest of one-third vaves could not be interpreted in terms of standard statistics, nor is it possible to design reasonably imple devices for recording this quantity. An alternate definition is based on the average time etween zero crossings. This can be interpreted in terms of standard statistics, and instruments can be devised for recording it. Moreover, a definition based on zero crossings is as much in accord vith the natural tendency of observers as the previous definition of characteristic period. It vould seem that characteristic period is not a useful concept and should be dropped. Two instruments for directly measuring the average zero crossing frequency are described. *Subject Heading:* **1. Ocean wave height measurement techniques.**—*Author's introduction.*

12M–173 532.59:551.46.086

Spiess, F. N., (*Calif. Univ.*), **Acceleration measurements in the deep ocean.** *Journal of Marine Research,* New Haven, Conn., 16(1):23–33, **1957.** 5 figs. (incl. photo), 4 refs., eqs. **DWB, DLC**—The study of surface waves in the deep ocean can be carried out effectively by ising a new technique: measurement of accelerations of a small water mass well below the surface. Instrumentation for carrying out such measurements is described in detail, including a pecial accelerometer, neutrally buoyant case, long light-weight slack wire, and data-recording quipment. Some initial results achieved with this equipment are shown and the possibility of roader applications of this technique for wave and gravity measurements at sea are discussed riefly. *Subject Headings:* **1. Ocean wave measurement instruments 2. Ocean wave acceleraion meters.**—*Author's abstract.*

12M–174 551.46.081:538.56

Terada, K. (*Nagasaki Marine Obs., Nagasaki, Japan*), **Measurement of displacement by an lectromagnetic device and its application to oceanographic measurements.** (In: UNESCO Symposium on Physical Oceanography, Tokyo, Oct. 1955, **Proceedings,** pub. **1957.** p. 21–25. 5 figs. French summary p. 21.) **DWB**—A description of techniques and some schematic diarams explaining the construction and use of a new wave pressure gage. Further use of an lectromagnetic device is extended to the construction and operation of a remote recording tide age. *Subject Headings:* **1. Ocean wave pressure gages 2. Ocean tide gages.**—*E.Z.S.*

12M–175 551.46.086:532.59.07

Tucker, M. J., **The N.I.O. wave analyzer.** *Conference on Coastal Engineering Instruments, st, Berkeley, Calif., Oct. 13–Nov. 2, 1955, Proceedings,* pub. **1956.** p. 129–133. 3 figs., 5 refs. Reprinted in *National Institute of Oceanography, Wormley, England, Collected Reprints,* Vol. 5, No. 166, **1957. DN-HO**—This analyzer gives the amplitude-frequency spectrum of a black-and vhite profile record prepared, usually photographically, on paper 5½ in. wide and 63 in. long. The ecord is fixed around a drum which is then set in rotation, and a photoelectric pick-up converts he record into a signal which repeats with the period of the drum. The analyzer will resolve he signal into the individual harmonics of this basic period from the 8th to about 120th, with useful analysis up to the 200th harmonic. A fixed-frequency filter is used and the rate of roduction is varied. The analyzer is a development of that described by BARBER et al. in *Nature,* 58:329, **1946.** The analyzer described here was designed for the study of surface gravity waves nd related phenomena, but has also found use in other fields. *Subject Headings:* **1. Ocean vave spectra 2. Ocean wave analyzers.**—*Author's abstract.*

12M–176 532.59:551.46.086:525.6

Unoki, Sanae, **Effect of tides on the magnification of the wave recorder using a standipe.** *Oceanographical Society of Japan, Journal,* 12(3):79–80, **1956.** 3 figs., 3 eqs. In

Japanese; English summary, p. 79. Reprinted as *Tokyo, Japan. Meteorological Research stitute. Oceanographical Lab., Collected Reprints,* Vol. 4, No. 54, May 1957. **DWB**– mechanical wave gage designed by Y. Ota is described and the effect of tidal fluctuations u its readings is analyzed. The instrument, whose main advantage is simplicity and cheapness, found to be suitable only for places where the height of tidal or wave activity is not excess *Subject Headings:* **1. Ocean wave recorders 2. Ocean tide effects on wave measurements** *G.T.*

12M–177 551.46.086:551.465:532

Vilenskii, Ia. G. and Glukhovskiĭ, B. Kh., **Tenzometricheskii sudovoi volnograf GM** [Tensometric wavemeters for ships.] *Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Insti Trudy,* No. 47:48–73, **1959.** 15 figs., 2 tables, 4 eqs. Russian summary p. 73. **DWB**– detailed description, with the aid of photographs and current diagrams and relevant equati of the construction, underlying theory, and operation of a tensometric wave meter for measu the heights and periods of sea and ocean waves. The apparatus is based upon the hydrost principle. The recordings of the recording part, which is suspended from a freely drifting f and immersed to a depth of half the mean height of the waves measured, are transmitted by a c to an automatic potentiometer mounted upon a vessel. The contents of this paper include following, viz: the requirement for a wave recorder; the receiving portion of the wave record the recording portion of the wave recorder; the winch with the cable; the float; the float rigg clamp and hawser; fundamental technical data on the wave recorder; the results of sea experim with the apparatus carried out by an interdepartmental committee; calibration of the appar in a basin; measurements and mounting of the wave recorder on a vessel; preparation of wave recorder for measurements; the wave measurements and form of the record; and calcula of wave heights and periods from the wave record and determination of wave heights and peri *Subject Heading:* **1. Ocean wave meters.**—*I.L.D.*

12M–178 532.59:551.46

Vinogradov, V. V., **O tarirovochnoĭ krivoĭ volnografa tipa VOM-50.** [The calibra curve of the VOM-50 wave recorder.] *Meteorologiia i Gidrologiia,* Leningrad, No. 9:42, 1 table, ref. **DWB, DLC**—The wave recorder VOM-50 is provided with a calibration certifi according to which the value of the contact of the instrument (in meters) is considered consta a range of wave heights 0.5 to 8 m. The certificate is the result of calibration data carried ou horizontal basins since field studies have shown that the calibration coefficient increases with height of waves. The author presents a table giving calibration coefficients of three turbines function of height of waves. *Subject Heading:* **1. Ocean wave recorders**—*I.L.D.*

CURRENT METERS

See also: **Current measurement in coastal waters,** 12M–369.

12M–179 551.46

Carruthers, J. N., **Carruthers current meter and wire angle gage.** *Conference on Co Engineering Instruments, 1st, Berkeley, Calif., Oct. 31–Nov. 2, 1955, Proceedings,* pub. 1 p. 255–259. 4 refs. Reprinted in *National Institute of Oceanography, Wormley, England, lected Reprints,* Vol. 5, No. 164, **1957. DN-HO**—Some instruments developed by the au and subsequently improved upon, are described briefly. One of them, the directional clino may be described as a clinometer encased in a hot gelatine solution that solidifies after imme in the sea and causes the slope measuring indicator and the compass to become locked for reading. Another device is made to check the "just-off-bottom" currents. Some riding float described as means of observing any depth of water movements near shore under storm conditions. *Subject Headings:* **1. Ocean current meters 2. Clinometers.**—*W.N.*

12M–180 551.4

Carruthers, J. N. (*British Natl. Inst. of Oceanog*), **Concerning new cheap and si ways of measuring bottom and near-surface currents on the high seas without the req ment of good weather.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprin abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 535–537. French summary p. **DWB** (551.46.082. I61pr)—A new simple device "Pisa" to measure currents on the high s described. The new device is cheap enough for use from modestly equipped ships. The acteristic features of "Pisa" are that it (1) can "integrate out" wave-caused movements o instrument, (2) repeat single observations at a fixed position near surface and on bottom make a single observation of the speed and direction of any bottom current from a drifting and (4) can be used for several single observations on bottom water movements. The device n

ossible single observations of current speed and direction each hour at a number of depths at
e same time. The work need not be stopped by winds up to Force 7 or 8. *Subject Headings:*
Ocean current meters 2. Ocean current measurement.—*I.S.*

12M–181 551.46.085

Carruthers, J. N. (*British Nat. Inst. of Oceanog.*), **On getting information on estuaries and**
earshore circulations by very simple means. *International Oceanographic Congress, 1st, N. Y.,*
959, Preprints of abstracts of papers. Issued Wash., D. C., AAAS, **1959.** p. 677–678. French
mmary p. 678. **DWB** (551.46.082. I61pr)—Simple instruments devised to study currents in
tuaries and nearshore are briefly described. By means of these devices water movement can
e studied both on the bottom and at various levels in the water column. The instruments de-
ribed are a simple jelly bottle and an equally simple device "Pisa" to measure profiles of tidal
ream speed, and a new clockless "neutrally-buoyant totalizing current-meter" which can yield
mple information on the total water movements in various directions during the tidal period.
ubject Heading: **1. Ocean current meters.**—*I.S.*

12M–182 551.46.085

Deacon, G. E. R. (*Natl. Inst. of Oceanog., Godalming, Surrey, Eng.*). **Deep-current meas-**
rements. (In: UNESCO Symposium on Physical Oceanography, Tokyo, Oct. 1955, **Proceed-**
gs, pub. 1957. p. 20. French summary p. 20) **DWB**—Useful results have been obtained
use of neutrally buoyant floats whose weight can be adjusted so that they will float at pre-
etermined depths and provide deep-current measurements. A detailed account of the method
given by J. C. Swallow in *Deep Sea Research,* Vol. 3, **1955.** *Subject Headings:* **1. Deep-**
urrent measurements 2. Neutrally buoyant floats 3. Ocean current measurement instru-
ents.—*E.Z.S.*

12M–183 551.46.085:551.465

Deacon, George Edward Raven, **Deep ocean currents.** *Discovery,* London, 18(9):386–387,
957. 2 figs., refs. **DLC.** Reprinted in *National Institute of Oceanography, Wormley, England,*
ollected Reprints, Vol. 5, No. 209, **1957. DN-HO**—Measurements are made with the aid of a
a-sonde. It is described as being an acoustical transmitter sending out a "ping" sound (hence
e name pinger). The transmitter is attached to one of the sealed ends of the two aluminum
bes equipped with weight to equalize the pressure at certain depths, enabling the "pinger" to float
ong with the deep sea current it measures. The device is shown in two photographs and shown
a circuit diagram. Measurements at different depths have been conducted in co-operation with
e U. S. Woods Hole Oceanographic Institution. *Subject Headings:* **1. Ocean currents 2.**
cean current measurement instruments 3. Pingers.—*W.N.*

12M–184 551.46.085

Illarionov, V. I., **Struemer: izmeritel' skorosti i napravleniia techeniia.** [Current meter:
device for measuring speed and direction of flow.] *Meteorologiia i Gidrologiia,* Leningrad, No.
:49–53, June **1958.** 2 figs., table. **DWB, DLC**—With the aid of diagrams the author describes
detail the principle and construction of a meter measuring the magnetic azimuth of the direc-
on of a water current. It is based upon the measurement of the angle in the horizontal plane
etween the northern end of the magnetic arrow and the longitudinal axis of the body of a
drometric type Zh-3 rotator. The angle is measured by electric current impulses with an
ectric counter while the rotator is not removed from the water. A single impulse corresponds
2°. The results of measurements of azimuthal angles with the current meter and with the
mpass of a marine rotator are presented in a table and they indicate that the precision of the
rmer is not inferior to that of the latter. *Subject Heading:* **1. Ocean current meters.**—*I.L.D.*

12M–185 551.46.085

Knauss, John A. and Reid, Joseph L., **The effects of cable design on the accuracy of the**
EK. *American Geophysical Union, Transactions,* 38(3):320–325, June **1957.** 2 figs., 3 tables,
refs., 13 eqs. **DWB, DLC**—Simultaneous observations with a GEK and a drifting drogue
ere made in order to test the validity of the GEK for surface current measurements. The
erage current velocity was obtained by plotting the drogue trajectory by celestial fixes and
her navigational means. Tests were conducted using various types of GEK cables. A cable
ving a density greater than that of sea water creates an error termed 'cable droop'; a lower
ble density creates an error termed 'windage.' Good agreement between the average GEK
locity and the average drogue velocity is obtained when allowance is made for windage and
oop. *Subject Headings:* **1. GEK 2.Ocean current measurement instruments.**—*Authors'*
stract.

12M–186 551.46.07

Meshcherskiĭ, V. I., **Priviaznye poplavki s osveshcheniem.** [Anchored buoys with ill
nation.] *Meteorologiia i Gidrologiia,* Leningrad, No. 5:56, May **1956.** fig. **DWB**—A des
tion with the aid of a diagram of an illuminated buoy. The illumination is at the top; an ele
flash light lamp is fed by a battery solution in the interior of the buoy. *Subject Heading*
Buoys.—*I.L.D.*

12M–187 551.46

Meshcherskiĭ, V. I., **Izmerenie glubinnykh techeniĭ.** [Measurement of deep curre
Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Institut, Trudy, No. 37:79–84, **1959.** 3
4 refs., Russian summary p. 84. **DWB**—Various methods and devices for measuring deep w
currents from a moving ship are briefly outlined with illustrations and references to the Amer
English and Russian practices. The following devices and their operation are discussed:
electro-magnetic velocity meter, (2) bathy-pitometer with Pitot or Bourdon tube, (3) float
neutral buoyancy, (4) parachute drogues and (5) Makaron-Nansen's rotator with the ele
contacts (collector) submerged on various depths on the insulated cable and contacted to
automatic recorder of electric impulses. *Subject Headings:* **1. Ocean current measurem**
2. Current meters—*N.P.S.*

12M–188 551.4

Nakano, Masito (*Met. Res. Inst., Tokyo*), **Some oceanographical instruments rec
devised by the members of the Central Meteorological Observatory and its subord
organs.** (In: UNESCO Symposium on Physical Oceanography, Tokyo, Oct. 1955, **Proceed**
pub. **1957.** p. 30–37. 17 figs., 13 refs. French summary p. 30.) **DWB**—Three new cu
meters, Nan'niti's current meter using a phototube, Nan'niti's profile current meter and the
current meter are briefly described. Four new wave recorders, Ota's wave recorder, Ishig
wave recorder, Ishiguro's wave pressure recorder and Watanabe's wave pressure recorder are
described, as are the Yakame type and Tsukamoto type of tele-tide gages. In addition a
type of remote reading and recording thermometer designed by S. AGARI and NAN'NITI'S p
water sampler are described. A photograph of each device and a sample of the record proc
are shown. An improvement in the case of Forel's sea color scale is noted. *Subject Head*
1. Ocean current meters 2. Ocean wave recorders 3. Ocean tide gages.—*E.Z.S.*

12M–189 551.46.085:55

Nan'niti, T. (*Met. Res. Inst., Tokyo*), **On the structure of ocean currents, Pt. 3, A
Nan'niti-Iwamiya current meter and the current profile observed by it.** *Papers in Met
ogy and Geophysics,* Tokyo, 10(2):124–134, Dec. **1959.** 8 figs., 4 tables, 4 refs., 2 eqs. E
summary p. 124; Japanese summary p. 134. **DWB.** Reprinted as *Tokyo. Meteorologica
search Institute. Oceanographical Lab., Collected Reprints,* Vol. 6, June **1960.** Contrib. No.
A new simple current meter is described which will record both the current speed and its dire
on two smoked glass plates. Experiments in the field show that the vertical profiles of
currents can be determined successfully and rapidly. Some theoretical considerations are a
to the above current profiles, and the magnitudes of the order of the surface and bottom fri
at low wind velocities are estimated to be about 0.4 and 1.0 $g/cm/sec^2$. *Subject Heading*
Ocean current structure 2. Current meters.—*Author's abstract.*

12M–190 551.4

Ono, Kohei and Iwasa, Kinji, **The new current meters, recording and direct reading.**
UNESCO Symposium on Physical Oceanography, Tokyo, Oct. 1955, **Proceedings,** pub.
p. 26–29. 8 figs. French summaries p. 26 and 27–28.) **DWB**—Two new current meter
described. The construction and operation of the Ono self recording meter is explaine
provides a continuous and permanent record of velocity and direction and lasts at least 3
The Direct-Reading current meter model CM-3 gives direct measurements of velocity and
tion of currents and simultaneous temperature readings. It takes 10 or 15 min. to measu
vertical distribution of 100 m depth so the discontinuous layers can be detected in a short
Subject Heading: **1. Ocean current meters.**—*E.Z.S.*

12M–191 551.465:551.468.2(262):551.

Saint-Guily, Bernard (*Lab. d'Océanog. physique du Museum d'Histoire Naturelle*), **Me
de courant à l'ouvert de la Baie de Villefranche.** [Measurements of the current at the en
of the Villefranche Bay.] *France. Comité Central d'Océanographie et d'Etudes des
Cahiers océanographiques,* 11(8):602–604, Sept./Oct. **1959.** 4 figs. **DLC, DWB**—This
reports the current measurements made in 1957 and 1958 in Villefranche Bay. Two grou

rface current measurements are mentioned: a) six series of measurements, in calm weather and th an east wind, carried out between 25 April and 8 May 1957. Four floats made to be served by radar were floated and collected by two ships, b) between Sept. 3 and 17, 1958, nine her series were carried out using four new floats, lighter and better than the previous ones. wo trial measurements at 50 m depths were also carried out. The details of the methods of easurements and of results are also reported. The velocity and the direction of the currents ring various months are graphically represented. *Subject Headings:* **1. Ocean current meas-ements 2. Floats 3. Villefranche Bay, Mediterranean Sea.**—*I.S.*

12M–192 551.46.085

Swallow, J. C. (*Natl. Inst. of Oceanog., Wormley, Surrey*), **Notes on operating neutral-oyancy floats.** *National Research Council, Wash., D. C., Publication,* No. 473:25–27, **1957. WB** (551.46 N277pr), **DLC** (GC57.N33, 1956)—A discussion which points out some of the oblems and limitations involved in operating neutral buoyancy floats. Tracking the floats is nited to weather conditions of force 4 or better because of the arrangement of listening gear ed on board "Discovery II." The depth at which the floats can be worked is limited. A possible ay is suggested of measuring depth of float more accurately. Techniques in current measure-ents are discussed. The author suggests that it is unlikely that floats tend to sit on boundaries tween water masses. *Subject Headings:* **1. Neutrally buoyant floats 2. Floats 3. Ocean rrent measurement instruments.**—*E.Z.S.*

12M–193 551.46.085

Swallow, J. C., **Some further deep current measurements using neutrally-buoyant floats.** *eep-Sea Research,* London, 4(2):93–104, **1957.** 16 figs., 7 refs. **DLC.** Reprinted in *National stitute of Oceanography, Wormley, England, Collected Reprints,* Vol. 5, No. 196, **1957. DN-HO** -Nine more observations have been made since a previous account was written (Swallow, 1955) the design of a neutrally-buoyant float and its use in current-measuring. Currents ranging om 22 to 0.8 cm/sec have been measured, at depths between 340 and 2900 m. Some improve-ents have been made in the method of tracking the floats, and in determining the depths at ich they become neutrally buoyant. *Subject Headings:* **1. Ocean current measurement in-ruments 2. Neutrally buoyant floats 3. Floats.**—*Author's abstract.*

12M–194 551.465.085:532.593

Tabata, Susumu and Groll, A. W., **Effect of ship's roll on the Ekman current meter.** *nerican Geophysical Union, Transactions,* 37(4):425–428, Aug. **1956.** 2 figs., 2 tables, 2 refs. **WB, DLC, NRL**—Tests were made with a pair of Ekman current meters to observe the effect ship's roll upon their measurements and their behavior. In calm seaways where the current eed ranged from five to 45 cm/sec the speeds indicated by the two instruments were consistent thin five per cent, and the indicated directions were within four degrees. In weaker currents e direction difference is twice as large. When the sea/swell conditions became greater than 1 the scatter in the indicated speeds became greater than ten per cent, and the results were nsidered unusable. Directions were measured within an accuracy of ten degrees in sea/swell great as 2/3. One instrument was given an oscillation approximating a movement caused by ship's roll of 10 to 150°. Its recorded speeds were 1.5 times those measured by a stationary e. This increase is due to the excess revolutions made by the propeller of the oscillating strument during its downward swing. The increase in the scatter of the speed differences of e two instruments during sea/swell > 1/1 is attributed to this also. There was no appreciable riation in the directions during this artificial roll except when measurements were made in weak rrents. *Subject Headings:* **1. Ekman current meter 2. Ocean current measurements.**—*uthors' abstract.*

12M–195 551.46.085:551.46.062.7

Vinogradov, V. M., **Ledovyĭ zenker i prisposoblenie dlia opuskaniia vertushki pri rabote l'da.** [An ice countersink and a device for lowering a current meter during work from ice.] *ningrad. Gosudarstvennyĭ Gidrologicheskiĭ Institut, Trudy,* No. 70:81–83, **1958.** 2 figs. **DWB** The author proposes a method for drilling openings in ice sufficiently large for lowering a cur-nt meter fastened to a rod, beneath the ice. The meter is lowered vertically into the opening d the end of the rod is, for this purpose, hinged. The device for drilling through the ice con-ts of a bushing with two cutting edges attached to an ordinary ice auger. A similar device med a counter sink can cut holes 150 mm in diameter. The ice counter sink is fastened to the ill of the ice auger 5–10 cm from the cutting end by means of a screw. The drill of the ice ger with the counter sink and the operation of the lever terminal to which the gage is attached e illustrated with a photograph and a diagram respectively. *Subject Headings:* **1. Ice meas-ing instruments · 2. Current meters.**—*I.L.D.*

12M–196 551.46

International Association of Physical Oceanography, Rome, 1954, **Report of Committee Current Measurements.** W. S. Von Arx, secretary. Its *Procès-Verbaux*, pub. Bergen, 1 p. 107–108. **DWB**—The Committee reviewed the work done during the period from 1933 to present time. The Committee decided on the following program: 1) to compile a bibliogra of published descriptions of instruments and make descriptions of new devices; 2) to note fu possibilities suggested in literature and untried schemes and 3) to categorize merits of var types of directional vanes, propeller designs, sensing systems and recording apparatus. *Sub Headings:* **1. Oceanographic instruments 2. Ocean current measurement.—I. Von W. S.**—*A.M.P.*

12M–197 91.04(99):551.46.085:551.465(267.

Moroshkin, K. V. and Bogdanov, M. A., **Rezul'taty primeneniia elektromagnitnogo ism telia techniĭ vi Indiĭskom okeane i iuzhnoĭ chasti Tikhogo okeana.** [Results of the use of electromagnetic current meter in the Indian Ocean and the southern part of the Pacific Oce *Sovetskaia Antarkticheskaia Ekspeditsiia, 1955–,* [*Materialy*], Vol. 5, issued Leningrad 1 p. 124–137. 4 figs., 4 tables, 4 foot-refs. **DLC**—Complex hydrologic investigations conducte the Antarctic Expeditions on the Diesel-electric ship "Ob'" also included work on electromag measurement of water currents (EMIT). The accuracy of the early measurements was red considerably due to the effect of high sea waves. In the Second Expdition the special damper (compensator) was used for stabilized recording. The new equipment with diff instruments is described in detail and an outline of instruction for their adjustment and opera Attention is also given to preservation of the non-polarigines (cadmium) electrodes attache the end of the cables and towed behind the ship on different predetermined courses. Sp maneuvers of the ship for observation of current characteristics are described. Velocity direction of current are determined for the following courses: between Antarctica and Afric 20°, 40°, and 60°E long.; from Victoria Land (Antarctica) to New Zealand on 166°E long a northwesterly direction from Cocos Island on 100°E long. and from 30°S to equator and o Pacific Ocean areas between New Zealand and South America (North of the Antarctic circle 30°S long. These data are tabulated and shown on four maps. *Subject Headings:* **1. Ele magnetic current meters 2. Antarctic expeditions 3. Current measurements 4. In Ocean 5. Southern Pacific Ocean.**—*N.P.S.*

12M–198 551.46.081:551.

Irecki, N. P., **Tide-gage installation on shore-ice, employing (auxiliary) water- gage.** *Canada. Defense Research Board, Translation* T 336 R, March **1960.** 1 p. fig. D Transl. by E. R. Hope from original Russion in *Problemy Arktiki,* Leningrad, No. 6:117- **1959.** **DLC**—This report describes a method of using hydrographic gages on shore ice to the well from freezing. As shown in the figure, a water level gage is mounted on a metal to be frozen into the ice. The mechanism is explained with the aid of the figures. Observa at the installation will help to compile data on the immersion of ice under the influence of ext factors as well as determine the amount of upward growth of ice. *Subject Headings:* **1. gages 2. Water level gages.**—*A.H.K.*

12M–199 551.46.081:551.

Zav'ialov, K. D., **Registrator distantsionnogo samopistsa urovnia.** [Automatic telerec of water level.] *Leningrad. Gosudarstvennyĭ Gidrologicheskiĭ Institut, Trudy,* No. 70:6 **1958.** 2 figs. **DWB**—The automatic telerecorders of water levels is based upon the princip transmission of electrical impulses by a recorder which is an electromechanical device design record continuously upon a tape, the height of the water level. The receiver of electrical imp consists of two electromagnets which are inserted in the outlet of a three-ply conducting jun line. The counting summation mechanism consists of a unit of four ratchet wheels 30 m diameter, each with 20 teeth and two pairs of levers. The ratchet wheels are fastened t base of a screw along which is a container carrying a pen that moves and the wheels are fas in pairs so that their teeth are turned in different directions. The construction of the record described with the aid of a photograph and a diagram. *Subject Headings:* **1. Water leve corders 2. Oceanographic instruments.**—*I.L.D.*

DEPTH SOUNDING EQUIPMENT

12M–200 551.46.082:531.719.35:5

†Gabler, Heinz, **Über die Grenzen der Genauigkeit bei Echolotungen in ozeanis Seeräumen.** [Limits of accuracy of echo soundings in ocean regions.] *Deutsche H*

aphische Zeitschrift, Hamburg, 12(6):229–243, Dec. **1959.** 11 figs., 2 tables, 21 refs., 6 eqs.
erman, English and French summaries p. 229–230. **DWB, DLC**—To determine the limits of
curacy of echo sounding in ocean regions, the effect of regionally generalized mean values of
und velocity and of the directional diagrams of acoustic radiators and receivers as well as the
fluence exercised by measuring the echo running time and the recording accuracy of sound
npulses are, one after the other, made the subject of physical invstigations. As according to
servations at an oceanographic station, the dependency on depth of sea-water temperature could,
ith sufficient accuracy, be defined by approximation as an e-function—and, hence, was available
an analytically closed form—it was possible to carry out the integrations, necessary for calculating
e mean sound velocities, in a rigorous way. The results thus obtained allowed to determine the
unding errors expected to occur at this station owing to the regional generalization of mean
lues. At a depth of 5000 m the error amounts to about 25 m caused by the effect of the
rectional diagrams of sound vibrators, there may occur essentially greater errors when echo
undings are carried out across irregular ocean floors. The criterion for the occurrence of such
ulty soundings is stated. The quantitative investigations of the accuracy with regard to the
ho running time and to the record of sound impulses finally lead to the conclusion that in
umerous cases there is no need to use sounding recorders of so high a degree of technical perfec-
on as are available nowadays. The considerable advance in accuracy of reading sounding records
es not permit to attach too much importance to statements of an exaggerated accuracy because
their inadequacy to reality. Such statements have often become doubtful on behalf of the
evitable errors already associated with the mere application of the echo sounding method.
ubject Heading: **1. Sea sounding equipment.**—*Author's summary.*

12M–201 551.46.082:531.719.31

Hata, K., **On the correction of wire length in oceanographical observations.** *Oceano-
raphical Society of Japan, Journal,* 11(2):57–58, **1955.** 2 figs., 2 tables. In Japanese; English
mmary p. 57. **DWB.** Reprinted in *Hakodate, Japan. Marine Observatory, Bulletin,* No. 3
Contribution No. 9), Dec. **1956.**—The depth measured by the unprotected thermometer some-
mes does not agree with the expected depth, owing to the inclination of the wire caused by current
id wind. The author has tried to get an experimental formula which makes it possible to estimate
e depth of the sampling bottle by means of measuring the wire length and the angle between the
ire and the vertical above the sea-surface, and he got the following formula: $D = l \cos \theta - CO^n$
here D, l and θ are depth, wire length and angle, respectively; C, n are constants which vary
ith depth (600, 800, 1200, 1500 m). As illustrated in a figure, the results of estimation are
ry satisfactory for practical purpose. *Subject Heading:* **1. Ocean depth measurement tech-
iques.**—*Author's abstract.*

12M–202 551.46.082:531.719.35

Hersey, J. Brackett (*Woods Hole Oceanog. Inst., Mass.*), **Applications of acoustical tools
problems of deep sea research.** *National Research Council, Wash., D. C., Publication,* No.
73:90–97, **1957.** 4 figs. **DWB** (551.46 N277pr), **DLC** (GC57.N33, 1956)—The author briefly
escribes the techniques and acoustical tools used in research work for the solution of the follow-
g deep-sea research problems: the measurement of acoustic travel time, the acoustical telemeter-
g and the sound scattering studies. *Subject Headings:* **1. Acoustical sounding of ocean 2.
coustical equipment 3. Sea sounding equipment.**—*N.N.*

12M–203 551.46:082:531.719.35:77.058.2

Johnson, Henry R.; Backus, Richard H.; Hersey, J. B. and Owen, David M., **Suspended
cho-sounder and camera studies of midwater sound scatters.** *Deep-Sea Research,* London,
(4):266–272, Sept. **1956.** 7 figs., 2 tables, 21 refs. **DLC**—Twelve-kilocycle-per-second echo
unders have been lowered in the sea to observe sound scatterers at short range. Once, an echo
under was lowered to a point midway between the surface and a deep scattering layer to record
e latter during its evening ascent. Individual scatterers moved upward at a rate of about 15
et per minute. It was estimated that there was about one scatterer for each 650 m³ of water
the time of the layer's passage by the transducer. On another occasion a transducer was
wered at night by 35-fathom increments to a depth of about 400 fathoms. Counts of strong
atterers at the several levels were made save in the uppermost where scattering was too intense.
ater volume per scatterer varied from about 800 to 2000 m³ depending on the depth of the
servation. A camera has also been used with the echo sounder to obtain simultaneous acoustic
d photographic records of scatterers. The most successful experiments show a correlation
tween pictures of fishes and strong echoes. *Subject Headings:* **1. Marine sounding equipment
Underwater cameras.**—*Authors' abstract.*

12M–204 551.46.082:531.71

Knott, S. T. and Hersey, J. B., **Interpretation of high-resolution echo-sounding te
niques and their use in bathymetry, marine geophysics, and biology.** *Deep-Sea Resea*
London, 4(1):36–44, Dec. **1956.** 7 figs., table, 11 refs. **DLC**—Experience in making obse
tions with commercially available correlation recorders designed for sounding ocean depths
suggested design modifications which would combine the capabilities of both shallow- and d
water sounders in one instrument as well as improve their general performance for resea
The design and construction of such a recorder is described. Some examples are given of
application to the study of smaller-scale bottom features; to the echo location of fish sch
individual fishes, and other aggregations of marine animals; and for locating instrument
depth and range. Occasionally echo-sounder pings penetrate the bottom to reflect from de
horizons; the recorder then presents a continuous-structure section. By using a sound so
having a broad spectrum instead of the usual single-frequency ping, and by extending the rece
design to record in two or more filter bands, shallow structures have been observed which c
not be recorded with the high frequency of the conventional echo sounder. *Subject Headi*
1. Echo sounding equipment 2. Sea sounding equipment.—*Authors' abstract.*

12M–205 551.46.082:531.71

Teramoto, Toshihiko, **Depth determination in oceanographic observations.** *Record
Oceanographic Works in Japan,* 4(2):170–185, March 1958. 9 figs., (incl. photo), 3 refs.,
Reprinted as *Tokyo. Univ. Geophysical Institute, Geophysical Notes,* 11(1), Contribution
12, **1958. DWB**—The accuracy of the depth determination by thermometric sounding which
been commonly used in oceanographic observations is examined. In the next step, the au
shows that the depths determined by the use of underwater clinometers (wire angle gages)
comparable accuracy. Needless to say, the latter method is less expensive and far less tro
some than the former. *Subject Headings:* **1. Thermometric soundings 2. Oceanogra
equipment 3. Clinometers.**—*Author's abstract.*

LUMINESCENCE

12M–206 551.46.077:551.46.085(261/

Clarke, George L. and Wertheim, Gunther K., **Measurements of illumination at g
depths and at night in the Atlantic Ocean by means of a new bathyphotometer.** *Deep
Research,* London, 3(3):189–205, April **1956.** 9 figs., table, 19 refs. **DLC**—The bathyphotom
described is a combination of a light-meter employing a photomultiplier tube and a depthm
employing a bourdon tube. The spectral sensitivity of the instrument extends approxim
from 320 m to 650 m with a maximum at 480 m. Illumination as low as 10^{-7} w/cm^2 (about
of full sunlight) and depths as great as 610 m can be read directly on deck. The instrument
permits the direct investigation of the light factor in the sea at depths and intensities far b
those measurable by photovoltaic photometers. Measurements of transparency made in the Fl
Current off Miami gave extinction coefficients ranging from .031 to .056 for various strata bet
depths of 20 and 580 m. In the slope water about 200 mi SE of New York extinction coeffic
of .062 to .072 were obtained for the upper 90 m and of .032 to .041 for layers extending to 59
These results, together with previous meagre information, indicate a uniform and high transpar
for the water between 100 m and 600 m. Measurements made at night in both localities sh
that the illumination decreased with depth in the upper layers at about the same rate as du
the day. Flashes of light, presumably from luminescent animals, were observed, particular
the lower strata. At depths greater than 300 m the background light remained about consta
tended to increase. In one instance the general illumination at night at 600 m was about as
as during the day with individual flashes almost one thousand times greater. *Subject Headi*
1. Bathyphotometers 2. Ocean light measurements 3. Atlantic Ocean.—*Authors' abst*

12M–207 551.521.17:551.463:5

Catala-Stucki, René, **Nouveaux organismes marins présentant des effets de fluoresc
par l'action des rayons ultraviolets.** [New marine organisms presenting fluorescence e
under the action of ultraviolet radiation.] *Académie des Sciences, Paris, Comptes Rendus,*
(6):1128, Feb. 8, **1960. DWB, DLC**—Research made at the Marine Biology Station (No
Aquarium) had proved the existence of fluorescence effects by the deep-water corals.
recent research show that certain marin organisms at weak depths (between 1 and 3 m) also
to ultraviolet radiations. *Subject Headings:* **1. Bioluminescence 2. Ultraviolet radia
penetration in sea 3. Nouméa, New Caledonia Island, Southwest Pacific Ocean.**—*A.V.*

12M–208 551.46.082:77.058.2:531.7

Consteau, J.-Y. (*Dir., Oceanog. Museum, Monaco*), **De quelques techniques secondaire
océanographie.** [Some secondary techniques in oceanography.] (In: France. Centre Nat

la Recherche Scientifique, **La topographie et la géologie des profondeurs océaniques.** Paris, 59. p. 213–219. English summary p. 213.) **DLC** (GC83.F7)—The paper attempts to throw me additional light on auxiliary techniques in oceanography. After discussing the qualities, well as weaknesses, of nylon cables, the writer describes advances made into the "pictorial" ld of oceanographic research. In the domain of photography, the paper explores the possibilities an independent diver as well as those of non-manned apparatus or even small submarines and e bathyscaphe. EDGERTON has recently put the finishing touches on a most ingenious camera: ch time that a phosphorescent organism passes within the field of the lens, an ultra-sensitive otomultiplier activates the release of the camera's electronic flash. Photographs of the ocean ttom itself are obtained through an independent nacelle which is let down. Coupled with the tra-sound sender known as "tik-tik," this camera constructed on the very principle of the thyscaphe, has given most encouraging results. A second apparatus is a sleigh which is pulled ong the bottom and which records a "photo-dredging." The author is not totally convinced of e possibilities of underwater television, except on a pilot basis and down about 3000 ft. Perhaps cables were suppressed and actual television permitted a succession of rapid belinograms, there ould be an extension of the use of the television approach. *Subject Heading:* **1. Oceanographic otography.**—*Author's abstract.*

12M–209 551.46.079:77.058.2:771.3

Edgerton, Harold E. (*MIT*) and Cousteau, Jacques Yves, (*Inst. Oceanog., Monaco*), **Under-ater camera positioning by sonar.** *Review of Scientific Instruments*, N. Y., 30(12):1125–26, Dec. **1959.** figs., 3 refs., eq. **DWB, DLC**—A description is given of the sonar device hich is designed to monitor the camera-bottom distance, so that the operator without the necesty of contact can hold the camera at about the right distance above the bottom. The camera will xpose films at a 15 sec interval for hundreds of photographs covering a period of about two ours. The operation of the sonar system is described. A deep-sea sonar transducer with prese timing for recording is graphically represented. *Subject Headings:* **1. Submarine photogphy 2. Sonar devices.**—*I.S.*

12M–210 551.46.079:593.14

Inoue, Naoichi; Nishizawa, Satoshi and Fukuda, Masaaki (*all, Fisheries Dep., Hokkaido niv. Japan*), **The perfection of a turbidity meter and the photographic study of suspended atter and plankton in the sea using an undersea observation chamber.** (In: UNESCO mposium on Physical Oceanography, Tokyo, Oct. 1955, **Proceedings**, pub. **1957.** p. 53–58. figs., 11 photos. French summary p. 53) **DWB**—Two types of turbidity meters are described d diagrammed schematically. An undersea chamber for observation and photography of susnded matter and plankton has been in use. Marine snow has been seen and photographed. is the aggregate remains of planton sinking very slowly to the bottom in various stages of cterial decomposition. Sketches and photos show the photographic apparatus and a sea bottom ew. *Subject Headings:* **1. Marine turbidity meters 2. Marine snow 3. Submarine photogphy.** *E.Z.S.*

12M–211 551.46.062.3:551.463.5:535.51

Ivanoff, Alexandre (*Museum National d'Histoire Naturelle, Paris*), **Un polarimètre sousarin à cellule photoélectrique: premiers résultats obtenus.** [Single cell photoelectric under ater polarimeter: first results.] *France. Comité Central d'Océanographie et d'Etudes des Côtes, ulletin d'Information*, 9(9):491–499, Nov. **1957.** 2 figs. (incl. photos), tables, 7 refs. **DWB**—new polarimeter for submarine use is described. Two photographs with identifying captions ow its parts. Results of tests made from 3 to 8 June 1957 near Marseille are tabulated. The ta includes various horizontal directions and various depths, as well as results using colored ters or no filters. These data suggest that polarization decreases with depth and varies horintally. *Subject Headings:* **1. Submarine polarimeters 2. Optical oceanography 3. Polaration of submarine illumination 4. Marseille, France.**—*E.Z.S.*

12M–212 551.46.078:551.464.5:534.4

Ivanoff, Alexandre (*Paris*), **A new water sampler and a new scattering-polarizing-meter r optical investigation of the ocean.** *International Oceanographic Congress, 1st, N. Y., 59, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 553–555. 2 figs. ench summary p. 555. **DWB** (551.46082. I61pr)—In order to remove many difficulties in the dy of the scattering properties of water samples a new device consisting of a new water sampler d a new scattering-polarizing-meter was developed. The operational details of the instruments e given and graphically illustrated. The new device was tried for the first time in April 1959 f Monaco. The results presented in graphic form show that the error of the scattering coefficient never exceeds ± 5%, but that the error of the factor of depolarization reaches sometime ± 1 *Subject Headings:* **1. Marine optical investigations 2. Ocean water samplers 3. Scatter polarizing meters.**—*I.S.*

12M–213 551.46.079:551.462:77

Laughton, A. S., **Electronic flash illuminates the deep ocean.** *British Communications Electronics,* (4:21), Jan. **1957.** fig., photo.—Reprinted in *National Institute of Oceanogra Wormley, England, Collected Reprints,* Vol. 5, No. 186, **1957. DN-HO**—The electronic camera described briefly was developed at the National Institute of Oceanography and is aboard "Discovery II." Acoustical signals are received aboard when the camera hits the sea by which the camera can be triggered or else by a fish pulling a bait. Block diagrams a flash photo from 10,000 ft depth are shown. *Subject Headings:* **1. Oceanographic investiga 2. Submarine photography 3. Electronic flash camera.**—*W.N.*

12M–214 551.46.079:77.0

Laughton, A. S., **Photography of the ocean floor.** *Endeavour,* London, 18(72):178– Oct. **1959.** 17 figs., 2 refs. **DLC**—The design of an automatic camera which can photog the ocean floor at depths up to 18,000 ft is described and illustrated, based on one develope the National Institute of Oceanography (1957). Attempts have been made since 1893 (Bou with diver-operated cameras, but it wasn't until 1940 that Ewing, Vine and Worzel took tures of the sea floor with a fully automatic camera. Now they are used in all parts of world to study sea life, minerals, rates of sedimentation, slopes, lava flows, glaciation, Ripples have been noted at depths of 1700 fathoms showing evidence of currents at these de Almost every photo taken in the deep ocean shows some kind of life in its undisturbed hal which is not the case with dredged specimens. Over a dozen excellent color photos of the o bottom are reproduced with ample annotations. The method may prove useful in measu currents on the sea floor and to control drilling in the sea bed. *Subject Headings:* **1. Subma photography 2. Deep-sea cameras 3. Ocean bottom ripples.**—*M.R.*

12M–215 551.46.082:7

Lazarenko, N. N., **K voprosu ispol'zovaniia aerometodov v okeanograficheskikh issl vaniiakh.** [Problem of the application of aerial methods in oceanographic investigati *Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Institut, Trudy,* No. 37:85–93, **1959.** 4 fig tables. Russian summary p. 93. Review by I. A. Cherkasov and V. G. Zdanovich in *Met logiia i Gidrologiia,* Moscow, No. 9:52–54, Sept. **1960. DWB**—Aerial photography of the h logic conditions of the sea surface, such as storm waves, ice-drifts, depths, character of the bo and underwater banks and reefs is described in detail with illustrations. Method of deter tion of the aeroplane position at the moment of the aerophoto-surveying are discussed wit consideration of errors of observation varying with the aeroplane speed and altitudes. Coord of the surveyed sea area are determined with the synchronized angular orientation of the obj center angle of longitudinal inclination, angle of transversal inclination and the angle relati the aeroplane motion. The methods of triangulation with the theodolite or radar and radio communication with three point shore observers are described with a graphic illustration a map. Advantages of aerophoto-surveying are discussed. *Subject Heading:* **1. Aerial oc graphic surveys.**—*N.P.S.*

12M–216 551.46.079:77

Mahringer, Werner (*Vienna*), **Der Oberflächeneffekt bei der Messung der Lichtd lässigkeit des Wassers mit dem Lunzer-Unterwasserphotometer.** [Surface effect in the urement of light transmissivity of water by means of the Lunz underwater photometer.] *W und Leben,* Vienna, 10(5/7)83–86, **1958.** fig., 3 tables. **DLC**—During investigations wit Lunz underwater photometer the uppermost meter layer could never be used in the evalu since the transmission values varied considerably and non-uniformly from measurements at g depths. The dependence of this effect upon solar elevation, measuring depth, the damping and the wavelength of the light to be measured is investigated by experiments in which cont of 1 m and 2 m depth rather than natural waters were used. In the ten containers it shown that the disturbance effect is restricted to a depth of 2–3 cm. Up to this depth the ured transmission falls to 65–80% of that measured just below the surface. Below 2.5 normal transimissivity of 70% per meter layer prevails. Measurements made in natural w showed that the disturbance effect does not depend upon solar elevation and the spectrum r both during clear and cloud covered skies. The magnitude of the surface effect, i.e., the de in the intensity of the light measured, depends upon the damping discs so that their thicknes their composition, whether plexiglass or glass, are important; also whether their surfac nooth or rough is relevant. Different damping discs influence the transmissivity of various pectrum regions; the attenuation is more marked in the short wave than in the long wave region. lso the difference of transmission Ry 5—By 12 is greater for a smooth than a rough surface; is 4.7% in the former and 2.8% in the latter. *Subject Headings:* **1. Marine optical properties Ocean light transmission 3. Lunz underwater photometer.**—*I.L.D.*

12M–217 551.46.079:77.058.2

Posgay, J. A. (*U. S. Fish & Wildlife Serv., Woods Hole*), **The underwater camera as a ool for studying benthic communities.** *International Oceanographic Congress, 1st, N. Y., 1959, reprints of abstract of papers.* Issued Wash., D. C., AAAS, **1959.** p. 483. **DWB** (551.46082. 51pr)—A semi-automatic underwater camera with a seventy-five degree angle of view has been pecifically designed for investigating the distribution and density of the visible members of the ontinental shelf bottom communities. The special features of the instrument are described. An xample of its use in the quantitative investigation of the sea scallop beds of Georges Bank is ven. *Subject Headings:* **1. Underwater cameras 2. Sea scallops 3. Georges Bank, North tlantic.**—*Author's abstract.*

12M–218 551.466.2:532.59:778.35

Sharikov, Iu. D. and Cherkasov, I. A., **Aerofotos"emka v izuchenii morskikh volneniĭ.** Use of aerial photography in studying sea wave.] *Priroda*, Moscow, 47(4):83–85, April **1958.** 3 figs. **DLC**—The use of aerial photography in studying the kinematic and dynamic properties f sea waves in the U.S.S.R. and abroad is discussed briefly and the method of stereophotography eveloped in the U.S.S.R. is described. Two aerial caremas were placed on the wings of an rplane at a distance of 23.6 meters so that photographs could not be made from high altitudes. nother method developed by the Laboratory of Aerial Methods involves the use of two airplanes. oth aerial cameras are controlled from one airplane during actual photography. The distance etween airplanes is controlled by an optical sight and its precise amount is determined during hotogrammetric analysis of pairs of stereo pictures. By varying the size of the photographic ase it becomes possible to increase the height from which photographs can be taken so that the rea to be photographed can be increased without loss of precision. Aerial photographs of sea urface waves showing direction normal to the wave front, a sketch of the relief along the orizontal, and curves of wave profiles are presented. *Subject Headings:* **1. Ocean waves 2. erial photography of ocean waves.**—*I.L.D.*

RESEARCH VESSELS

12M–219 551.46.073:629.12

Engel, Rene L. and Pierce, Firth (*both, U.S.N. Ord. Testing Lab., China Lake, Calif.*), **eep sea research vessel: the D. R. V.,** *International Oceanographic Congress, 1st, N. Y., 1959, reprints of abstracts of papers.* Issued Wash., D.C., AAAS, **1959.** p. 540–541. fig. French ummary p. 541. **DWB** (551.46082. I61pr)—A brief description of a ship being designed by the aval Ordnance Test Station (China Lake, Calif.) for the purpose of exploring the ocean at all epths. The shape of this 83 ton vessel will be very similar to that of a submarine and it will ossess considerable mobility, cruising range, and scientific equipment. The vessel will be used undertake all types of oceanographic observations including visual and photographic exploration f the deep sea, sounding and mapping of the bottom, oceanographic measurements, bottom sampling, ater sampling, and geophysical measurements. *Subject Headings:* **1. Oceanographic research essels 2. Deep sea research vessels.**—*I.S.*

12M–220 551.46.073:629.12

Kosarev, A. N., **Odin iz sposobov krepleniia lebedok tipa "marka IV."** [One of the meths of re-enforcing type-4 winches.] *Meteorologiia i Gidrologiia*, Leningrad, No. 3:47–48, March **959. DWB, DLC**—L. L. Plokhov proposed another method of fastening type-4 winch. Planks angle bars with opening for bolts are welded to the gusset of a bulwark and winches are stened to them in horizontal positions. In such a method of fastening it is possible to prepare em quickly for work or removal. This method is used successfully in expeditions on the aspian Sea on hydrographic vessels. *Subject Headings:* **1. Hydrographic vessels 2. Winches.** -*I.L.D.*

12M–221 551.46.077:626.02:629.12:612

Perrimond-Trouchet, R. (*Pharmacien-Chimiste principal de la Marine*), **Possibilités humaines pénétration sous-marine.** [Possibilities of human submarine penetration.] (In: France. entre National de la Recherche Scientifique, **La topographie et la géologie des profondeurs céaniques.** Paris, **1959.** p. 239–244. English summary p. 239.) **DLC** (GC83.F7)—Only a

few years ago did pioneers attempt to cross what seemed an impassable barrier, one of the l remaining frontiers: the ocean. At this time, regardless of some results, we must admit th little progress is made in our attempts to dominate the sub-marine environment and that advanc are extremely modest. One of the main reasons for this situation is the fact that man cann withstand the extreme pressures to which he is submitted as he dives deeper and deeper. circumvent this handicap, he has built units into which he locks himself and which are capab of resisting those pressures. This, however, limits his possibilities of movement; man becom merely an observer, and a very limited one at that, since his field of vision is pretty narrow. Th paper examines subsequently the physiological effects of independent diving. The respirato mixture, at great depths, acts differently than at atmospheric pressure and nitrogen becom under certain conditions, toxic. It becomes quite evident that, even allowing for individ variations, it is impossible to escape the toxicity of the respiratory mixture below depths rangi from 150 to 200 ft. This has, naturally, led to research aiming at modifying the qualitative a quantitative composition of the respiratory mixtures used to supply divers. Experimentation, this field, has not yet reached any significant conclusion. At this time, the British use helium a Sweden uses hydrogen to replace nitrogen. So far, the paper examined dangers inherent descending and remaining at great depths. There are real dangers connected with the ascend well. Man acting as an independent diver, has reached the limits to which he can descend a our present knowledge does not permit us to think that he will be able to go any deeper, hence endeavors to perfect pressure resistant diving apparatus, and observation units if one prefers, wh are built to attain greater and greater depths. *Subject heading:* **1. Human submarine penet tion.**—*Author's abstract.*

12M–222 91.04:551.46.073:629.124.6:551.506

Sysoev, N. N., **Sovetskoe ekspedisionnoe sudno "Vitiaz'."** [Soviet expeditionary s "Vitiaz'."] Moscow, **1959.** 30 p. 13 figs., 5 tables. Table of contents in Russian and Engli English summary p. 30. At head of t-p.: Mezhdunarodnyĭ Geofizicheskiĭ God, 1957–1958, An Géophysique Internationale. **DLC** (VM315.S95)—A complete description and illustration of Soviet Oceanographic ship "Vitiaz," a 5700 ton, 110 ft diesel with a cruising range of 18,500 It contains 14 laboratories (physical, meteorological, geochemical, hydrologic, geologic, lunt acoustic, current, photo, isotope, microbiologic, etc.) and a scientific library. The first "Viti was used in an 1870–71 ethnographic expedition, the second in 1886–1889 by Admiral S. Makarov, for oceanographic research in the Pacific. The present ship was constructed in 1 in Germany as the "Mars" and was converted in 1947–48. Details of construction (shown drawings), photos and description of laboratories and installations (including the meteorolog laboratory), of the wench and coring, trawling bottom photography and other gear, the dist recording meteorological station, current measuring apparatus of 6 types and finally suggesti for other types of vessels for special oceanographic research (diesel-electric ships of 3–5 thous tons and 16–18 kn speed, capable of up to 15,000 mi cruising range). *Subject Headings:* **Oceanographic vessel—"Vitiaz" 2. Soviet oceanographic vessels 3. Distant record meteorological station.**—*M.R.*

GRAVITY METERS

12M–223 551.46.08:52

First sea surface gravimeter. *American Geophysical Union, Transactions,* 39(1):175– Feb. **1958.** 4 figs. **DWB, DLC**—J. Lamar Worzel, Assistant Director of the Lamont C logical Observatory at Columbia University successfully made the first sea surface measurem of gravity in the open sea on Nov. 22, 1957 by using a new sea gravimeter developed by An Graf of Munich. During the IGY this instrument is being tested and it is hoped that it will used aboard all the oceanographic research vessels. Its description and operation are discus in this report. *Subject Headings:* **1. Sea surface gravimeters 2. Graf Sea Gravimeter.**—*N*

12M–224 551.46.08:52

Sukhodol'skiĭ, V. V., **Pribor dlia registratsii uskoreniĭ naklonov pri opredeleniiakh tiazhesti na more.** [Apparatus for recording accelerations and tilts in determination of gra forces at sea.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.,* No. 11:1570–1578, Nov. 1 10 figs., ref., 18 eqs. Russian summary p. 1570. **DLC**—To make marine gravimetric observat it is necessary to record all tilts and horizontal accelerations in two diametrically opposed di tions and also to consider the vertical accelerations of the base of the instrument itself. A spe apparatus, was designed by the author for these purposes. It consists of two tilt indicators long period pendulum and vertical accelerometer. Description of its electrical and mechan arrangements and diagrams and photographs of general views are included. The operation sensitivity of each part of the apparatus are described. *Subject Headings:* **1. Gravity meas ments at sea 2. Gravity measuring instruments.**—*N.P.S.*

12M–225 551.46.08:526.76

Worzel, J. Lamar (*Lamont Geol. Obs. Col. U. Palisades, N. Y.*), **Continuous gravity meas-**
ements on a surface ship with the Graf Sea Gravimeter. *Journal of Geophysical Research,*
ash., D. C., 64(9):1299–1315, Sept. **1959.** 16 figs., 2 tables, 17 refs. **DLC**—Gravity meas-
ements were made aboard the surface vessel U.S.S. "Compass Island" (EAG 153) with the
af Sea Gravimeter mounted on a stabilized platform. Repeated observations along a line of
avity measurements previously made in submarines showed discrepancies of the order of the
vigational variations. Many additional measurements agree satisfactorily with nearby previous
bmarine measurements. It was demonstrated that the swell is the principal limitation to the
easurements on Compass Island. When the vertical heave becomes too large, the boom of the
strument strikes the walls of its case, making observations impossible. On a five-week cruise
the Mediterranean during March and April, 1958, observations were made 50 percent of the
ne in the Atlantic and 90 percent of the time in the Mediterranean. The problem of measuring
e Eotvos correction is more severe on a surface ship than on a submarine because of the larger
fects from winds and currents to which the surface ship is subjected. This problem and the
oblem of locating the observation lines are the most serious difficulties encountered in making
avity measurements at sea. The value of continuous gravity observations is demonstrated by
amples of anomalies observed over seamounts, across the Mid-Atlantic Ridge, over the Canary
sin, in the Tyrrhenian Sea, and through the Strait of Gibraltar. Continuous observations
duce the chance of computational errors, prevent overlooking unanticipated features, provide a
ore representative gravity anomaly for an area, and provide more definitive data for the curve
ting that is required for geological interpretation of anomalies. The Graf Sea Gravimeter in
njunction with a stable platform initiates a new era in the measurement of gravity at sea.
eas which are too hazardous for submarine observations can now be readily investigated. *Sub-*
ct Headings: **1. Sea surface gravity measurements 2. Graf Sea Gravimeter.**—*Author's*
stract.

ELECTRICAL CONDUCTIVITY METERS

12M–226 551.46.083.7:550.372

Cecchini, A. (*Ingénieur a la Compagnie des compteurs*), **Enregistrement continu de la con-**
ctibilité électrique des fonds marins. [Continuous recording of the electrical conductivity
the sea bottom.] (In: France. Centre National de la Recherche Scientifique, **La topographie**
la géologie des profondeurs océaniques. Paris, **1959.** p. 277–282. fig., eq. English sum-
ary p. 277.) **DLC** (GC83.F7)—A towed electrode system, derived from geophysical pros-
cting methods, is described, to measure continuously the sea-bottom conductivity. The water
pth and conductivity are simultaneously measured. *Subject Heading:* **1. Sea bottom con-**
ctivity measurement techniques.—*Author's abstract.*

RADIOACTIVITY MEASUREMENT TECHNIQUES

12M–227 551.464.16:541.28

†Craig, Harmon (*Scripps Inst. of Oceanog., Univ. of Calif.*), **Isotopic tracer techniques for**
easurement of physical processes in the sea and the atmosphere. *National Research Coun-*
, Wash., D. C. Publication, No. 551:103–120, **1957.** tables, 34 refs. **DWB** (539.7 N277ef),
LC (Qh91.N28)—With any ocean-atmosphere system in mind the two phases of which are
parated by the air-water interface and each phase divided further by the thermocline and tropo-
use respectively, the author reviews findings of various authors on the distribution of natural
d artificial radioisotopes and its possible uses in studying physical processes in the sea and
nosphere. The radioactive elements discussed are carbon 14, tritium, beryllium 7, deuterium,
ygen 18, carbon 13, krypton 85, strontium 90 and cesium 137. Processes which have been or
ay be investigated by means of these elements include oceanic mixing rate, air sea exchange
d atmospheric residence time of carbon dioxide, meltwater amount in ocean in polar regions,
atospheric storage, etc. *Subject Headings:* **1. Isotopic tracer techniques 2. Ocean radio-**
tivity measurement techniques 3. Atmospheric radioactivity measurement techniques.—
T.

12M–228 551.46.018

Communication from the International Agency for C¹⁴ Determination. *Journal of Marine*
search, New Haven, Conn., 16(3):308–309, Oct. 15, **1958. DWB, DLC**—The Agency has
en established at Charlottenlund Slot, Charlottenlund, Denmark and the standardized ampoules
C^{14} activity may be obtained from this agency at a nominal cost. The C^{14} method has been
ed widely during recent years for measuring the production of organic matter in the sea. If the
rchaser wishes, he may buy the ampoules together with numbered membrane filters and have

the Agency do the processing. In addition, filtration apparatus, water samplers, field kits, filte special filter holders, and other pertinent equipment are also available. Write to the Ager or to either John H. Ryther, Woods Hole Oceanographic Institution, Woods Hole, Mas or Maxwell S. Doty, Botany Dept., University of Hawaii, Honolulu. *Subject Headings:* **Marine research 2. C^{14} determination 3. Charlottenlund, Denmark.**—*I.S.*

MECHANICS AND MODELS

12M–229 551.511.3:551.46.0

Dalverny, J. and Fontanet, F., **Réalisation de plaques tournantes. Plaque de Grenob** [Construction of rotating slabs. Grenoble model.] *La Houille Blanche,* Grenoble, 14(5):59 606, Aug. 1959. 8 figs., 3 photos. French and English summaries p. 598. **DLC**—The first p of the paper examines stray effects which uneven rotation of the table might set up in the moc Deductions are made from this concerning the amount of precision required during machin erection and maintenance of the roller track and concerning the accuracy with which the rotatio speed has to be maintained. The second part consists of a description of the following two desig prepared by the Laboratoire Dauphinois d'Hydraulique on behalf of the University of Grenob a) a floating model guided by a roller track carrying a very small load (discarded design), b rigid table guided by a roller track and borne by a centrally located step-bearing (model n being built). *Subject Headings:* **1. Experimental hydrodynamics 2. Sea currents 3. Ocea tides 4. Earth's rotation effects.**—*Authors' abstract.*

12M–230 551.46.077:551.526.6:621.31

Elmendorf, C. H. and Heezen, Bruce C., **Oceanographic information for engineering s marine cable systems.** *Bell System Technical Journal,* N. Y., 36(5)1047–1093, Sept. 19 28 figs. (1 fold.), 2 tables, 7 refs. **DWB, DLC**—An extensive discussion of methods of termining ocean depths, bottom consistancy and deep (as well as shallow) water temperatures the North Atlantic, with special reference to telephone cable maintenance across the Atlan Actual temperature data (isotherms) for cross sections of the Atlantic at different latitudes shown in graphic form. Change in bottom and top layer temperature's over a period of 25 ye are discussed and illustrated. A general warming of up to 2°C has occurred in the shallow wat (> 2000 m). Short period variations in shelf-edge bottom deep waters amount to 8°C (due displacements) and in coastal waters to 20°C. *Subject Headings:* **1. Oceanographic measu ment techniques 2. Submarine cable systems 3. Ocean temperature data 4. Atlantic Oce** —*M.R.*

12M–231 551.510.5:551.46.

Faller, Alan J. and von Arx, William S. (*both, Woods Hole Oceanog. Inst.*), **The model of fluid flow on a planetary scale.** *Hydraulics Conference, University of Iowa, 7th, June 19 Proceedings,* pub. 1959. p. 53–72. 11 figs., 16 refs., 5 eqs. **DWB** (523 H995pr)—Descr the reconstruction of natural processes in miniature. The text includes numerous photogra illustrations of atmospheric and oceanographic models. The discussion first emphasizes the g significance of atmospheric- and ocean-model research, and then gives the planetary mode criteria. Later, a brief survey is made of some recent work with atmospheric models to illust the manner in which these criteria are applied. Following this, ocean models are discussed illustrate the sequence of their development of their eventual contribution to a modern theory ocean circulation. *Subject Headings:* **1. Planetary fluid flow 2. Fluid flow 3. Atmosph models 4. Oceanographic models.**—*I. S.*

12M–232 551.46:62

Rutsein, Milton S., **Flooded quarries for experimental work.** *American Geophysical Un Transactions,* 38(5):688–690, Oct. 1957. fig., table, 5 refs. **DWB, DLC**—Flooded quarries some technical and economic advantages for underwater experimental work and for testing oce graphic equipment, particularly where explosions are involved or where wave action must minimized. The quarries visited in and near New England are described. *Subject Headi* **1. Underwater experiments in flooded quarries 2. New England.**—*Author's abstract.*

12M–233 551.4

Vine, Allyn C. (*Woods Hole Oceanog. Inst., Mass.*), **Vehicles as instruments for ocea raphers.** *National Research Council, Wash., D. C., Publication,* No. 473:98–104, **1957.** 3 table. **DWB** (551.46 N277pr), **DLC** (GC57.N33, 1956)—Beaches, ships, aircrafts and marines have been our major platforms for the study of waves and swell as well as for the s of ocean weather. Each of these is discussed in relation to its importance to oceanographers weathermen. *Subject Heading:* **1. Oceanographic observation methods.**—*N.N.*

12M–234 551.46.08:621.398

Frantz, David H., Jr. (*Woods Hole Oceanog. Inst., Mass.*), **Use of recording and tele-etering buoys in deep sea research.** *National Research Council, Wash., D. C., Publication,* o. 473:137–144, **1957. DWB** (551.46 N277pr), **DLC** (GC57.N33, 1956)—This paper com-ares the surface and the sub-surface buoys as used in recording and telemetering systems. The ithor thinks that for reliable results over ranges greater than 500 mi, 100 to 200-watt trans-itters should be considered the minimum in order to obtain the best meteorological and oceano-aphic data from the deep-sea areas. There is a need for reliable, all-weather anchored stations om which both surface and sub-surface information can be obtained. *Subject Headings:* **1. ceanographic investigations 2. Oceanograph instruments 3. Marine observation tech-ques 4. Telemetering buoys.**—*N.N.*

BATHYSCAPHES AND MESOSCAPHES

12M–235 551.46.073

Isaacs, John D.; Huffer, Robert P. and Kidd, Lewis W. (*all, Scripps Inst. of Oceanog., aJolla, Calif.*), **Instrument stations in the deep sea.** *Science,* Wash., D. C. 125(3243):341, eb. 22, **1957. DWB, DLC**—In recent operations in the Pacific Northeast Trade wind area ripps Institution oceanographers succeeded in mooring 16 instrument stations for 4 months at epths of 3200–4700 m for the purpose of obtaining synoptic data over a large area. The pri-ary float is below the level of wave action. Highest winds were 32 km. Only 2 stations were artially destroyed. Maximum drift was < ± 1 mi and of the float ± 300 m. *Subject Headings:* **Deep sea instrument stations 2. Synoptic oceanographic observations 3. Northeast acific Ocean.**—*M.R.*

12M–236 551.46.073:551.46.077:626.02

Dietz, Robert (*Office of Naval Res., London*), **The bathyscaphe and deep-sea research.** *ational Research Council, Wash., D. C., Publication,* No. 473:121–136, **1957. DWB** (551.46 277pr), **DLC** (GC57.N33, 1956)—An announcement of Soviet success in obtaining deep sea ore 34 m in length from the "Vitiaz." This report outlines the success attained with the athyscaph and other instruments used in data recording of deep sea investigations in the U.S.S.R. id of similar strides in the U. S. A discussion of the history, technical adventures and the esent status of the "Trieste" is included. A submarine helicopter-like device, the mesoscaph, preparation in the U. S. is described. *Subject Headings:* **1. Oceanographic investigations Oceanographic instruments 3. Bathyscaphs 4. Mesoscaphs.**—*N.N.*

12M–237 551.46.077:551.462

Houot, G., **Le bathyscaphe et l'exploration des grandes profondeurs.** [The bathyscaph id the exploration of great depths.] (In: France. Centre National de la Recherche Scienti-que, **La topographie et la géologie des profondeurs océaniques.** Paris, **1959.** p. 233–237. photos. English summary p. 233.) **DLC** (GC83.F7)—This paper describes the bathyscaph id its equipment. There is unfortunately only room for 2 persons in the nacelle; the pilot and e observer. Sounding apparatus is connected at a distance of some 1200 to 1500 ft from the ottom. The ascent is started by letting loose the guide-rope and is accelerated by the decom-ession of gasoline. The principal results harvested through the use of the bathyscaph fall ithin the domains of biology and physical oceanography, but with increased use, new investigation ossibilities come to light. While the builders of the bathyscaph are fully aware that at this oint the engine is far from perfect and is barely in an experimental stage it must be credited ith the opening of a door which will never again be shut and with starting, even in its infancy, systematic study of the oceans. *Subject Heading:* **1. Bathyscaphs.**—*Author's abstract.*

12M–238 551.46.077:626.02

Martin, Jean, **Le rôle des bathyscaphes dans l'exploration scientifique des Océans.** [The le of bathyscaph in the scientific exploration of ocean.] *L'Astronomie,* Paris, 74(9):349–365, ept. **1960.** 4 figs. **DLC-NNC**—The word "bathyscaph" was introduced by the Swiss professor UGUSTE PICCARD. Two bathyscaphs are actually in service, each of them having successively en presented under two version: F.N.R.S.2 and F.N.R.S.3, with the same sphere and the Trieste I" and "Trieste II," with different spheres. The author gives a short historical account the construction of these two bathyscaphs, recalls which organizations subsidized them and esents some considerations about the dives they have made. A description is given of the heres, general equipment, mechanism of linking with the surface and functioning principle ring the dives. The U. S. Navy financed a program of scientific research with the "Trieste" the Mediterranean Sea. The record dive (10,915 m) was performed on Jan. 23, 1960 by CQUES PICCARD and DONALD WALSH. The scientific research made by the bathyscaphs espe-

cially concerns biology, geology, and physical oceanography. The results obtained during the di
made between 1954 and 1957 are summarized in a work published by the Annales de l'Insti
Océanographique. The dives with bathyscaphs made it possible to determine the nature of
silt covering the bottom of the oceans, and provided indications of bottom topography. In phys
oceanography, research particularly concerned the nature of currents in the neighborhood of
bottoms and the depth of oceans. The principles of various methods to determine the depth
ocean are briefly laid out as well as the measurements and results yielded in the field of phys
and biological acoustics. At last, the author mentions various investigations which will be m
with the help of the bathyscaphs and especially measurements on magnetic field intensity, e
tromagnetism and radioactivity. *Subject Headings:* **1. Deep sea research 2. Deep sea sou
ings 3. Bathymetry 4. Bathyscaphs 5. "F.N.R.S." and "Trieste."**—*A.V.*

12M–239 551.46.

Piccard, Jacques (*Committee for Oceanog. Res. by the Bathyscaphe "Trieste"*), **Ocean
rapher must now go down himself.** *National Research Council, Wash., D. C., Publication,*
473:112–120, 1957. fig. **DWB** (551.46 N277pr), **DLC** (GC57.N33, 1956)—Two devices
deep-sea exploration, the bathyscaph and the mesoscaph, are described. Mentions circumstan
in which it is very useful for the oceanographer to descend to observe the deep-sea where au
matic instruments fail to observe the area. *Subject Headings:* **1. Oceanographic resea
methods 2. Bathyscaphs 3. Mesoscaphs.**—*N.N.*

12M–240 551.46.

Piccard, Jacques and Dietz, Robert S., **Oceanographic observations by the bathysca
"Trieste" (1953–1956).** *Deep-Sea Research,* London, 4(4):221–229, **1957.** 5 figs., 5 r
DLC—The bathyscaph *Trieste,* a radically new type of submersible craft analogous to a "blin
permits manned descents to the deep sea floor for the first time. Bathyscaphs appear desti
to remain the only type of craft with this capability. Although the primary promise of this c
is for oceanographic research, to date it has been necessary to concentrate on development
safety, rather than on research, in order that its full potentialities can be realized. Thus, sc
tific results are as yet meagre but sufficiently interesting to summarize here. A brief descrip
of the bathyscaph principle is given, followed by a summary of physical, biological, and geolog
observations, which have been made thus far. The special advantages of the bathyscaph
conventional oceanographic ships are mentioned. These are: (1) visual inspection of the d
water layers, and especially of the bottom, (2) visual control of sampling, (3) elimination of
need for long electric cables when using electronic equipment. *Subject Headings:* **1. Bat
scaphs 2. "Trieste."**—*Author's abstract.*

SEDIMENT SAMPLING METHODS AND INSTRUMENTS

See also: **Study of movement of littoral debris by tracers** (Griesseier), 12M–428; **Luminous tracers for study of movement of coastal material** (Griesseier), 12M–429; **Alluvium trap** (Gugniaev), 12M–431.

12M–241 551.46.08:553.621

Aĭbulatov, N. A. and Susliaev, A. S., **Shatangovyĭ dnocherpatel' dlia vziatii prob gru
[A rod-type excavator for removing bottom samples.] *Meteorologiia i Gidrologiia,* No. 12:39-
Dec. 1959. ref. **DWB, DLC**—Movement of sand on the underwater shore slope are stu
with so called "marked" sand (treated by ultraviolet rays) which is released into the water.
sand samples taken out by different excavating devices are studied for content of the "mark
sand, thus tracing the movement of sand. The machine shop of the Black Sea Experime
Station of the Institute of the Oceanology has designed a new sample excavating device, with r
able bucket, attached to a frame on a long rod. Arrangement of details of this device and me
of operation are described in the text with illustration. *Subject Headings:* **1. Bottom sedi
samplers 2. Sediment transport.**—*N.P.S.*

12M–242 551.4

Glezen, William H., (*Gulf Res. and Dev. Co., Houston, Tex.*), **An external core cat
for oceanographic work.** *Journal of Marine Research,* New Haven, Conn., 6(1):55–59, 1
2 figs. **DWB, DLC**—A core catcher for use with short gravity-type core barrels is descri
A flat plate at the foot of a pair of pivot arms is caused to swing under the bottom of the
barrel after the barrel is withdrawn from the bottom. A float-weight lever arm is employe
actuate the device. *Subject Headings:* **1. Oceanographic instruments 2. Core catchers
Bottom corers.**—*Author's abstract.*

12M–243 551.46.088:551.462:577.4

†Hedgpeth, Joel W. (*Scripps Inst. of Oceanography, La Jolla, Calif.*),**Obtaining ecological ta in the sea.** *Geological Society of America, Memoir,* No. 67, Vol. 1:53–86, Dec. 1957. figs., bibliog. p. 80–80. **DLC** (QH542.N3)—Methods of observing and obtaining marine ganisms (sampling) in situ are discussed in detail. Diving spheres, aqualungs, underwater evision, underwater photography, plankton recorders, complicated plankton samplers, as well nets are described and illustrated. Articles **Sampling the benthos** by Gunnar Thorson 61–73) and **Dredges and trawls** by Gordon Gunter (p. 73–80) give further details on quan-ative sampling techniques and devices. A long and well prepared bibliography is appended. *bject Headings:* **1. Marine sampling devices 2. Ocean bottom samplers**—*M.R.*

12M–244 551.46.08

Holme, N. A. (*Plymouth Lab.*), **A hopper for use when sieving bottom samples at sea.** *arine Biological Association of the United Kingdom, Plymouth, Journal,* 38(3):525–528, **1959.** igs., 2 refs. **DLC**—A hopper is described which facilitates the sieving of large quantities of tom soil at sea. It can be left unattended for short periods, and considerably reduces the or involved in sieving. Animals are probably less damaged by this than by the usual meth-s, as there is considerably less disturbance in the sieve. The apparatus may be used on any p where there is an adequate water supply to the deck, and it can be operated successfully in derately rough weather. *Subject Headings:* **1. Oceanographic dredges 2. Marine biology Hopper samples.**—*Author's summary.*

12M–245 551.526.64:551.462:551.351

Von Herzen, R. (*Scripps Inst., La Jolla, Calif.*) and Maxwell, A. E. (*Office of Naval Res., ash., D. C.*), **The measurement of thermal conductivity of deep-sea sediments by a needle-obe method.** *Journal of Geophysical Research,* Wash., D. C., 64(10):1557–1563, Oct. **1959.** igs., 4 tables, 13 refs., 5 eqs. **DLC**—The transient heating of a needle-probe is used to meas- the thermal conductivity of deep-sea sediments in 10 min. or less. An accuracy of 3 to 4 cent compares favorably with steady-state methods, and measurements by both methods on same sediments show good agreement. Thermal diffusivity of deep-sea sediments is shown be proportional to thermal conductivity, in agreement with theoretical expectations. *Subject adings:* **1. Thermal conductivity of deep sea sediments 2. Thermal conductivity needle-obes.**—*Authors' abstract.*

GEOLOGICAL OCEANOGRAPHY

See also: **Climatic record on ocean floor** (Arrhenius), 12M–616; **Arctic deep-sea sedimentation** (Hunkins), 12M–619; **Carbonates and carbon dioxide** (Revelle), 12M–686; **Submarine volcanism** (Buljan), 12M–740; **Influence of continental shelf on tides, Atlantic Coast, U. S.** (Redfield), 12M–861; **Chemical features of waters and sediments, Northwest Pacific** (Bruevich), 12M–949; **Recent oceanographic studies in the Arctic Basin** (Buinitskiĭ, 12M–1045; **Oceanographic and geophysical investigations at Arctic drifting station Charlie** (Cromie), 12M–1048.

ORIGIN OF OCEAN BASINS

See also: **Geophysical phenomena in circum-Pacific regions** (Ma and Pan), 12M–346.

12M–246 523.43:526.1:551.462.52

†Dietz, Robert S. (*Office of Naval Research*), **Point d'impact des astéroides comme origine s bassins océaniques: une hypothèse.** [Point of impact of asteroids as the origin of ocean sins: a hypothesis.] (In: France. Centre National de la Recherche Scientifique, **La topo-aphie et la géologie des profondeurs océaniques.** Paris, **1959.** p. 265–275. 2 plates, 17 s. English summary p. 265) **DLC** (GC83.F7)—The problem of the origin of the ocean basins d of the continents) is essentially a question of explaining the discontinuous development of Earth's outer "granitic" or sialic shell. Various theories have been expounded which can be erally classified as evolutionary (e.g., the continents may have been built up from the mantle gravitational differentiation and thermal convection) or as catastrophic (e.g., according to G. H. rwin's lunar extraction hypothesis). In this paper, the working hypothesis is suggested that ocean basins may have been formed early in Earth history by the highly explosive impact

of large cosmic bodies—most likely asteroids fragments of a planet which once occupied orbit between Mars and Jupiter. Such large collisions might account for the destruction fragmentation of any pre-existing world-encircling sialic layer. The crust-piercing impact w generate volcanism on a large scale. The impact scar would rapidly heal in the absence of sialic layer, but an ocean basin would remain because of isostatic factors. For evidence of cosmic collisions one must look to the Moon where, in the absence of erosion, volcanism, tectonism, the evidence of ancient events are still clearly preserved. Lunar maria, alth waterless, strongly resemble ocean basins. These maria, as best shown in Mare Imbrium, are reasonably explained by asteroid impacts. In fact, lunar craters and maria seem to belon the same family of features whose physiographic variability is a function of the size of impact. It is suggested that if the fragmentation of the lunar crust is the result of mete and asteroid impact, then the ocean basin may be similarly explained. Although such catastr collisions apparently have not occurred in recent geological time, they may have happened in Earth history following the destruction of a planet between Mars and Jupiter. *Subject H ing:* **1. Origin of ocean basins.**—*Author's abstract.*

12M–247 551.462:551.468:551.14:5

Klenova, M. V., **Problemy geologii moria.** [Problems of marine geology.] *Priroda,* Mos No. 12:39–42, Dec. **1958. DLC**—The problem of the thickness of the earth's crust is cl associated with the problem of the origin of the principal elements of the relief of the o namely, the continental shelf, continental slope, deep water canyons, etc. The thickness o earth's crust under the oceans is relatively slight, for example 4.8 to 7.45 km in the Ce Pacific; it is somewhat greater in the Atlantic and Indian Oceans. Recently the "Vitiaz'" covered a new underwater mountain chain in the northwest Pacific and a canyon 600 km long 6 km deep extending toward New Zealand and New Guinea. An underground elevation pa to the Caledonian of Scotland was discovered between Iceland and the Hebrides Islands. present two theories are proposed regarding the development of the ocean bed. One is ide with the development of geosynclines and leads to the formation of geosynclinal regions at the tion of the primordial oceanic earth's crust; the second involves the destruction of contin massifs and the origin of secondary oceanic canyons. This thalassogenic process began i Mesozoic and led to the destruction of the massifs of Gondiva and of the Northern Hemis and to the formation of secondary oceanic canyons. The problem of the theory of horiz movement of continents and of "continental bridge" await solution on the basis of fu geologic research on the ocean bottoms. Further research is required on the history o oceans and seas, including the geological sturcture of the continental shelf, geology of the c regions, accumulation of sediment in oceans and seas, the development of short lines and c zones of oceans, the structure of the surface layers of the ocean bottom and contemporary ment formation, the energy processes involved in the transformation of mineral substances pressure at the bottom of the ocean, etc. *Subject Headings:* **1. Earth's crust 2. Marine ge 3. Origin of ocean basins.**—*I.L.D.*

12M–248 551.462(267

Krishman, M. S., **History of the Indian Ocean.** *International Oceanographic Congres N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 34–36 English and German. **DWB** (551.46082 I61pr)—In Permo-Carboniferous times the site o present Indian Ocean was occupied by Gondwanaland. During the Permian, the Indian began to form in the East African and in the West Australian regions. In the Triassic or Jurassic, different units of Gondwanaland, India, Africa, Australia, etc., were drifting This process was completed by early Cretaceous. The Indian Ocean took its final shape d Tertiary, at the time of the great laval flows of the Deccan and the formation of the Him Mountain system. *Subject Headings:* **1. Geologic history of Indian Ocean 2. Indian C** —*I.S.*

12M–249 551.462.52

†Kuenen, Ph. H. (*Univ. of Groningen*), **L'âge d'un bassin Méditerranéen.** [The age Mediterranean basin.] In: France. Centre National de la Recherche Scientifique, La **graphie et la géologie des profondeurs océaniques,** Paris, **1959.** p. 157–163. 18 refs. lish summary p. 157) **DLC** (GC83.F7)—Reconnaissance of the directions of turbidity cu in Cretaceous and Oligocene flysch of the Alpes Maritimes has demonstrated a source situated to the south in the present Mediterranean. An estimate of the volume of se indicates that the source was formed by an extensive landmass. Subsidence of 300 m or since the Oligocene must have taken place. Geophysically an oceanic structure is probab

e present basin. If this is confirmed the important conclusion would be that a continental ock can be transformed to true ocean bed. If possible in one case it could also have taken ace in other parts of the ocean. *Subject Headings:* **1. Origin of ocean basins 2. Mediterrnean basins 3. Mediterranean Sea**—*Author's abstract.*

12M–250 551.462.52:551.14

†Liustikh, E. N., **O gipotezakh talassogeneza i glybakh zemnoĭ kory.** [Hypothesis on the rmation of oceans as related to the masses of the earth's crust.] *Akademiia Nauk SSSR, vestiia, Ser. Geofiz.*, No. 11:1542–1549, Nov. **1959.** 4 figs., 22 refs. Russian summary p. 1542. **LC**—The "Thalassogenesis" hypothesis concerns the formation of the present deep oceans as e result of lowering or destruction of former mainlands. Various aspects of this hypothesis are ewed from the positive and negative angles. New explanations by V. V. Belousov and M. V. URATOR of the thalassogenesis processes are discussed and illustrations given. They are comred with the "epeirophoresis hypothesis" which considers the shifting of the sialic core on the astic substrate. The hypothesis of "neomobility" is connected with the hypothesis of convection the earth's cover and is critically commented upon. *Subject Headings:* **1. Origin of ocean sins 2. Thalassogenesis 3. Epeirophoresis hypothesis.**—*N.P.S.*

12M–251 551.462(265/266)

Menard, Henry W., **Geology of the Pacific sea floor.** *Experientia, Basel,* 15(6):205–213, **59.** 6 figs., 19 foot-refs. German summary p. 213. **DLC.** Reprinted as *California Univ. ripps Institution of Oceanography, Contributions, 1959,* issued **1960.** p. 283–291. **DWB** 51.46 C153co)—The topography of the floor of the Pacific is briefly described and the origin various features considered. Tectonic intensity in the Pacific is noted. The age and origin of e Pacific Basin is discussed. If present sampling is adequate, the Pacific Basin is no older an Cretaceous. However, further sampling may indicate greater age and it seems more logical assume that the basin is as old as the continents. Biological evidence for former connections tween what are now widely separated continents can be explained without violating geophysical idence that continents have not subsided within ocean basins. Island stepping stones may vays have been present, forming a bridge for shallow water and land organisms that almost anned the Pacific. The distribution of topographic rises and ridges, fracture zones and spected fracture zones, atolls rising from volcanic platforms, seamounts and guyots are inted on maps of the Pacific. *Subject Headings:* **1. Origin of ocean basins 2. Submarine pography 3. Pacific Ocean.**—*E.Z.S.*

12M–252 551.1:551.462

Wilson, John Tuzo, **On the origin of continents, atmosphere and oceans.** *Royal Meteological Society, Canadian Branch* [*Publications*], 2(4), April1951. 9 p. **DWB**—The problem the formation of the atmosphere, hydrosphere and the continents is discussed in general terms. ıthor advocates the theory of their formation during geological time from volcanic action. The ıdy of Precambrian rocks is indicated as providing valuable clues to further work along this e and an area 60 m north of Toronto is suggested as particularly suited for such study. *Subct Headings:* **1. Origin of ocean basins 2. Origin of continents 3. Origin of atmosphere.** *G.T.*

12M–253 551.462:551.24

Yehara, Shingo, **The Austro-Asiatic continent block of the Pacific margin, and subergence of the south Japan Sea, Pt. 1.** *Journal of Geography,* Tokyo, 59(4):118–126, **1950.** figs. In Japanese; English summary p. 125–126. **DLC** (Orientalia)—This paper deals with e geologic characteristics of the Japanese archipelagoes and the southern islands, facing the ean depths, and the andesite line which curves strongly to the west toward the Halmahera Is. ie simatic rocks of the Pacific bottom should have moved between New Guinea and the Palauarianen Is., forming an asymmetric echelon structure. It is on this frame that geologic layers New Guinea extend far through Halmahera under the Philippine Sea and the Palau Is. group. ie crystalline schist of Japan Is. of New Guinea is connected with that of the Japanese Is. of e Palau group. The outer zone of Japanese Is., which consists of crystalline schist, Mikabu, ichibu, and Akigawa series, forms a monocline dipping north. The southern limit of the south pan Sea may be a Karenko (Formosa)-Sulpher Is. fault line, which corresponds to north idue 24°, and to the Neo-Wallace-Hosokawa line. The submergence of the south Japan Sea ay have occurred due to the depression of the outer zone which was thrust by the pushing out the Loochoo arc from the northwest. *Subject Headings:* **1. Origin of south Japan Sea South Japan Sea.**—*From author's abstract*

SUBMARINE TOPOGRAPHY

See also: 83 Colloquim, Nice 1958, 12M–49; **Pacific sea floor** (Menard), 12M–251; **Atlantic deep-sea sedimentation** (Heezen, Ericson), 12M–312; **Continental shelf of Gulf of Mexico** (Price), 12M–324; **Seismic refraction measurements** (Ewing, Ewing), 12M–341; **Deep sea floor off California** (Menard, Vacquier), 12M–347; **Continental shelves** (Holtedahl), 12M–362; **Atlantic Coast of the U. S.** (Redfield, 12M–861; **Kuroshio near the Izu Islands** (Fukuoka), 12M–959; **Relief of northern part of Greenland Sea** (Balakshin), 12M–1044.

12M–254 551.462:551.351.3(2

Belov, N. A. (*Arctic & Antarctic Res. Inst.*) and Lapina, N. N. (*Arctic Geol. Res. Ins*
Relief, bottom sediments and geological history of the central Arctic as related to hyd
logical conditions. *International Oceanographic Congress, 1st, N. Y., Aug. 31–Sept. 12, 19*
Preprints of abstracts of papers. Issued Wash., D. C., AAAS, **1959.** p. 11–13. In English
Russian. **DWB** (551.46082 I61pr)—Brief comment on the work carried out by Soviet scient
during the last ten years and how this work has significantly contributed to the knowledge
central Arctic and of the history of the Arctic Ocean. 450 bottom cores with an average len
of 100–150 cm and a maximum length of 360 cm have been collected. These data make it poss
to characterize the relief and bottom sediments of the central Arctic and to correlate the sedim
character with the hydrological regime. *Subject Headings:* **1. Geology of Arctic Ocean**
Marine sediments 3. Submarine topography 4. Arctic Ocean.—*I.S.*

12M–255 551.462:551.1(2

Big, Ching-chang (*Geol. Survey, Taiwan, Formosa*), **The shape of the Philippine Basin**
the relative movement between Asia and the western Pacific. *International Oceanogra*
Congress, 1st, N. Y., 1959, Preprints of abstracts of papers. Issued Wash., D. C., AAAS, 1
p. 15–16. French summary p. 16. **DWB** (551.46082 I61pr)—The Philippine Basin ha
rhombic configuration. The sinistral faults in the region are always parallel to the eastern
western sides of the Philippine Basin and the structures with a dextral movement pattern lie
the same direction with the basin's northern and southern sides. A common stress system se
to be represented. This suggests that the present diamond shape of the basin is produced b
shear that has driven the western Pacific floor northward and Asia in the opposite direct
Subject Headings: **1. Geologic structure of Philippine Basin 2. Western Pacific.**—*I.S.*

12M–256 551.462:0

Damiani, L. (*Bureau Hydrographique International*), **Nomenclature des formes profon**
du terrain océanique. [Nomenclature of ocean bottom features.] (In: France. Centre
tional de la Recherche Scientifique, **La topographie et la géologie des profondeurs océaniq**
Paris, **1959.** p. 221–231. English summary p. 221.) **DLC** (GC83.F7)—The necessity for
accurate terminology of submarine relief features only became really apparent after the F
World War when the great advance made in echo-soundings and their application on large s
upset in the span of a few years, our preconceived ideas on submarine topography. Neverthe
many years before, the International Geographical Congresses had considered the question.
Committee, set up by the VIIth International Geographical Congress, met in Wiesbaden in 1
under the presidency of H.S.H. PRINCE ALBERT I of Monaco and fixed the terminology used
the first edition of the General Bathymetric Chart of the Oceans. The nomenclature was rev
in 1912 on the occasion of the second edition of the Chart. From 1924 onwards, the Internati
Hydrographic Bureau took up the entire question and, with the cooperation of the Hydrogra
Offices, drew up a list of terms accompanied by their definitions and their equivalents in
languages of the various States Members. This nomenclature was adopted by various aut
(LITTLEHALES in 1932, SVERDRUP, JOHNSON and FLEMING in 1946). But in proportion as
increase in echo-soundings made it possible to establish more clearly the form of ocean featu
their accepted definitions and terminology proved to be inadequate, and in 1948 the IAPO appoi
a committee (the International Committee on the Nomenclature of Ocean Bottom Features),
sponsible for obtaining an international agreement on the nomenclature of the characteristic
tures in submarine topograph. To date the Committee has adopted the definitions and Eng
language terms of twenty-three major features of the ocean bed. A French committee under
presidency of BOURCART drew up a French translation of these terms and definitions. Some s
differences appear between the international terminology and the French translation. Prop
are made to smooth out these slight divergencies. In the conclusion, the considerable amoun
work which remains to be done as well as the difficulties are pointed out. *Subject Headi*
1. Submarine topography 2. Oceanographic terminology.—*Author's abstract.*

12M–257 551.462:551.461.8:551.1(265)
De Neve, George A. (*Andalas Univ. Indonesia*). **Eustatic movement on the Sunda shelf** ea. *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* ued Wash., D. C., AAAS, **1959.** p. 16–17. **DWB** (551.46082 I61pr)—The Gulf of Thailand, lacca Strait, the southwestern part of the China Sea, the Java Sea, and the adjoining southstern part of the Makassar Strait make up the Sunda shelf area. The existence of molars of *ephas sumatranus* Temminck in the northern part of the island of Bangka, found by the author March and April 1955, suggests that Bangka, as well as the other "Tin islands" on the Sunda elf area were still connected with Sumatra and the Malay Peninsula during the youngest eistocene. *Subject Headings:* **1. Eustatic sea level changes 2. *Elephas sumatranus* Tem**nck **3. Sunda shelf area.**—*I.S.*

12M–258 551.462:551.1(268)
Dietz, Robert S. and Shumway, George A. (*both, USN Electronics Lab., San Diego*), **ctic Basin geomorphology.** *International Oceanographic Congress, 1st, N. Y., 1959, Prents of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 18–19. **DWB** (551.46082 pr)—The geomorphic features of the Arctic Basin are briefly noted. These were revealed by first continuously recorded echo sounding profile across the center of the Arctic Basin, obned by the SSN Nautilus during its 1958 cruise from Pt. Barrow to the North Pole and from re to the Atlantic Ocean. *Subject Headings:* **1. Echo sounding data 2. Geomorphology the Arctic Basin 3. Arctic Basin.**—*I.S.*

12M–259 551.462:551.351.3
Emery, K. O. (*Univ. of Southern Calif.*), **Nature et origine de la bordure continentale ontinental borderland) au large de la Californie du Sud.** [Nature and origin of the conental rim along the coast of southern California.] (In: France. Centre National de la cherche Scientifique, **La topographie et la géologie des profondeurs océaniques.** Paris, **59.** p. 83–93. 4 figs. English summary p. 83). **DLC** (GC83.F7)—Along the coast of thern California there is a unique region called the continental borderland. The area may e been a geosyncline during the Jurassic Period but most of it was uplifted to form a broad d area during the Cretaceous, Eocene, and Oligocene. Erosional bevelling followed by a vnwarp allowed the region to be covered by epicontinental seas during the Miocene. Near the l of the Miocene Epoch the region became blockfaulted so that from the beginning of the Pliocene the present deep basins were separated by high areas that constitute islands and banks. The ins have received several thousand meters of sediment that were contributed fastest to the ins nearest shore. Sediment patterns in these nearshore basins reveal the present activity of bidity currents. Similar patterns in the now-filled Los Angeles Basin indicate that turbidity rents also were active filling agents during the Pliocene Epoch. *Subject Headings:* **1. Conental rim (borderland) 2. Southern California.**—*Author's abstract.*

12M–260 551.462:551.46.082:531.719.35:91.04(265)
Ganson, P. P.; Zenkevich, N. L.; Sergeev, I. V., et al., **Maksimal'nye glubiny microvogo eana.** [The greatest depths of the world ocean.] *Priroda,* Moscow, No. 6:84–88, June **1959.** igs. **DWB, DLC**—A historical survey of investigations of the greatest depths of the world an since 1874 precedes a description of the use of echo sounding devices. The authors describe l discuss the methods and results of the studies of sea bottom topography of the deepest sections Tonga and Mariana Trenchs carried out in 1957 by an expedition of the Soviet Institute of eanology on the ship "Vitiaz." *Subject Headings:* **1. Submarine topography 2. Echo sounds. 3. Tonga Trench 4. Mariana Trench. I. Udintsev, G. B.**—*A.M.P.*

12M–261 550.341.7:551.462:551.21
†Gaskell, T. F., **La structure sismique des grandes profondeurs océaniques.** [The seismic ıcture of great ocean depths.] (In: France. Centre National de la Recherche Scientifique, **topographie et la géologie des profondeurs océaniques.** Paris, **1959.** p. 149–156. 12 refs. glish summary p. 149) **DLC** (GC83.F7)—The most striking feature of the submarine geology the deep oceans that has been demonstrated by expeditions in the Atlantic, Pacific and Indian eans is the universal existence of a rock layer a few km below the sea bed in which the comssional wave velocity is 6.7 km/s. Geological and physical arguments suggest that this 6.7 /s layer consists of a basic crystalline rock. The material that covers the 6.7 km/s layers ears to consist of soft sediments and of a hard rock (compressional wave velocity 4.3–5.8 km/s). is possible that the hard rock ("Layer 2") is volcanic in some parts of the oceans, and ented sediment in others. The existence of a depression of the 7.7 km/s layer near islands seamounts provides confirmation of Darwin's theory of coral atoll formation in the Pacific.

However, the evidence for a regime of growth and subsequent sinking of volcanic features in Atlantic and the Western part of the Indian Ocean is not so definite as it is in the Pacific, this suggests that there may be differences between the Pacific and these other oceans. depth of the Mohorovicic discontinuity beneath all the oceans is about one-third of that ben the continents, so that oceans and continents do not appear to be interchangeable. There is s hope that deep borings into the earth's crust may, in the not too distant future, show what L 2 consists of and what kind of rock lies beneath the Mohorovicic discontinuity. *Subject H ings:* **1. Mohorovicic discontinuity 2. Geological structure of the Oceans 3. Atlantic O 4. Pacific Ocean 5. Indian Ocean.**—*Author's abstract.*

12M–262 551

Gougenheim, André, **Les caractéristiques de la contribution hydrographique à la naissance de la topographie sous-marine.** [Characteristics of hydrographic contribution to knowledge of submarine topography.] (In: France. Centre National de la Recherche S tifique, **La topographie et la géologie des profondeurs océaniques.** Paris, **1959.** p. 7 4 plates (fold.). English summary p. 73) **DLC** (GC83.F7)—Oceanographers run against difficulties in a morphological study of sea-beds, owing to the fact that it is practically impos for them, with their present means of investigation, to determine everywhere the depth of the with sufficient density and accuracy to give out a detailed structure of the submerged r Modern hydrographic surveys only are carried out for the present, with means powerful en to give us such knowledge as regards coastal regions and a few oceanic areas. The sound they involve are, besides, carefully discussed as to their size and position before we spot on the charts. These charts are consequently basic documents for the descriptive study of marine soil. *Subject Headings:* **1. Submarine topography 2. Hydrographic charts.**—*Aut abstract.*

12M–263 551.4

Groen, P. (*Vrije Universiteit, Amsterdam*), **On the temperature inversions in the Indonesian deep-sea basins.** *Nederlandsch Geologisch Mijnbouwkundig Genootschap, Hague, Verhandelingen: Geologische Ser.*, 18:157–164, May **1957.** 3 figs., 2 tables, 5 ref eqs. **CU, DGS**—East Indonesian deep-sea basins experience occurrences of temperature i sion. The theory explaining this phenomenon is discussed and illustrated. There is an inc in the inversion depth as the distance to the sill is increased. The average minimum tem tures in the Batian and Buru basins are compared. *Subject Headings:* **1. Temperature i sions in deep-sea basins 2. Indonesian seas.**—*N.N.*

12M–264 551.462:551.24

Heezen, Bruce C. (*Lamont Geol. Obs., Palisades, N. Y.*), **Outline of submarine topogra** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* I Wash., D. C., AAAS, **1959.** p. 29–32. 4 figs. In English and German. **DWB** (551. I61pr)—An outline of submarine topography is shown in a diagram. The oceans are clas into three morphologic divisions and categories which in turn, are divided into physiogr provinces. A graphic representation is given of major morphological divisions of North At Ocean. Also graphically illustrated are categories of continental margin provinces and prov of the mid-Atlantic Ridge represented on a precision depth recorder chart. *Subject Head* **1. Submarine topography 2. Mid-Atlantic Ridge 3. Atlantic Ocean.**—*I.S.*

12M–265 551.462

*†Heezen, Bruce C.; Tharp, Marie et al. (*all, Lamont Geol. Obs., Palisades, N. Y.*), **floors of the oceans, Pt. 1, The North Atlantic: text to accompany the physiographic gram of the North Atlantic.** N. Y., Geological Society of America, **1959.** 122 p. 49 30 plates (some fold. in pocket), bibliog. p. 109–113. "Physiographic diagrams of the published separately." Physiographic diagram available Map Division. **DLC** (G9101C2 H4) (*Geological Society of America, Special Paper*, 65) **DLC** (GC83.H43)—A small but prehensive monograph on submarine physiography and geology with special reference to the Atlantic, sediments, bottom photography, instruments and methods of charting depths and topography, geophysics of continental margins, seismicity of ocean floor, crustal structure, depths, submarine canyons, etc. in the North Atlantic starting with World War II and in 1957. The physiographic diagram shows many of the features referred to in the text. *ject Headings:* **1. Ocean bottom topography 2. North Atlantic. I. Ewing, Maurice.**—

12M–266 550.382.3:551.241:551.461.8:5

Heezen, Bruce C. (*Lamont Geol. Obs., Palisades, N. Y.*), **Paleomagnetism, continenta placements, and the origin of submarine topography.** *International Oceanographic Co*

, *N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 26–28.
. In English and Russian. **DWB** (551.46082 I61pr)—Measurements of remnent magnetism
rocks collected from individual continents give radically different paths for the poles. This
dence supports the controversial theory of continental drift. However, the existence of the
l-oceanic ridge provides evidence against continental drift. The postulate of an expanding
rth suggests a way out of the dilemma. Six profiles representing the "typical" ocean basin in
cessive stages of development are graphically illustrated. *Subject Headings:* **1. Paleomag-
tism 2. Continental drift 3. Submarine topography.**—*I.S.*

12M–267 551.462:001.4
†Herdman, Henry F. P.; Wiseman, John, D. H. et al., **Proposed names of features on the
ep-sea floor, Pt. 3, Southern or Antarctic Ocean.** *Deep-Sea Research,* London, 3(4):253–261,
ot. **1956.** 41 refs. **DLC**—The history of names in the Antarctic Ocean is discussed, fol-
ved by the names of those proposed by the British National Committee on the Nomenclature
Ocean Bottom Features. The selection is based on the Committee's published general prin-
les governing the allocation of names. *Subject Headings:* **1. Submarine topography 2.
tarctic Ocean. I. Ovey, Cameron D.**—*Authors' abstract.*

12M–268 551.462:551.24
Hess, H. H. (*Dept. Geology, Princeton Univ.*), **Nature of the great oceanic ridges.** *In-
national Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued
ash., D. C., AAAS, **1959** p. 33–34. **DWB** (551.46082 I61pr)—The dissimilarity between the
smic profiles on "old" and "young" ridges suggests that the ridges owe their origin to a volume
nge below the Mohorovicic discontinuity and that the volume change is reversible. The hy-
hesis is advanced that the process forming the ridges is serpentinization. The upward flowing
bs of mantle convection cells leave traces on the earth's surface. Serpentinization occurs as
result of water released at the top of the column. Heat moving slowly upward produces
erpentinization and subsidence of the ridge. *Subject Heading:* **1. Oceanic ridges 2.
rpentinization.**—*I.S.*

12M–269 551.583.3:551.324.63:551.462:551.461.8
Holtedahl, Hans, **Med geologene på havbunnen: det undersjöiske landskap.** [Accompany-
the geologists on the ocean bottom: the submarine landscape.] *Naturen,* Bergen, 83(7):435–
, **1959.** 5 figs. **DLC**—The topographic features of the submarine landscape are related to
climatic conditions in the glacial periods. Melting or accumulation of the ice mass being the
in factor, the gravitational ice pressure another. The melting of the Greenland ice mass
uld raise sea level by 8 m. *Subject Headings:* **1. Submarine topography 3. Glacial influ-
ces on submarine topography.**—*W.N.*

12M–270 551.462(268)
Hunkins, Kenneth (*Geophysics Dept., Stanford Univ.*), **The floor of the Arctic Ocean.**
erican Geophysical Union, Transactions, 40(2):159–162, June **1959.** 3 figs. **DWB, DLC**—
is report is based on a paper given at the IGY Symposium during the 125 meeting of the
erican Association for the Advancement of Science, Washington, D. C., Dec. 29–30, 1958.
presents some results of investigations of the Arctic Ocean floor and the upper few feet of
lerlying sediment. The methods used in these studies were echo soundings, dredge hauls of
tom material, submarine photography, bottom coring, and "grab" sampling. A profile of the
ctic Ocean floor approximately along the 167°W meridian is included. Bottom sediments are
efly described. *Subject Headings:* **1. Submarine topography 2. Marine sediments 3.
ctic Ocean.**—*E.Z.S.*

12M–271 551.1.:551.462(261)
Il'in, A. V., **O nekotorykh chertakh geomorfologii Atlanticheskogo okeana k severo-
padu ot Anglii.** [Features of the geomorphology of the Atlantic ocean northwest of England.]
ademiia Nauk SSSR, Doklady, 127(4):881–883, **1959.** fig., 6 refs. **DWB, DLC**—During
g. to Oct. 1957 the vessel "Equator" carried out a study of the submarine relief of the
antic Ocean by means of echo sounding and various new data on the structure of the bottom
the ocean northwest of England were obtained. An echo sounding profile through the Rokel
vation, and the North Atlantic ridge and a bathymetric diagram of the positions of large relief
ms are presented. The morphological features are described in detail. *Subject Headings:*
Submarine topography 2. North Atlantic Ocean.—*I.L.D.*

12M–272 551.462:551

†King, Lester C. (*Univ. of Natal, Durban, S. Africa*), **The origin and significance of great sub-oceanic ridges.** (In: Tasmania. Univ. Geology Dept., **Continental drift: a s posium, March 1956.** Hobart, Univ. of Tasmania, **1958.** p. 62–102, 8 figs., 37 refs.) **DW** A paper containing numerous illustrations of the great sub-oceanic ridges that span distance many thousands of miles in the North and South Atlantic, the Indian and the South Pa Oceans. The evidence presented supports the hypothesis of continental drift. In the section of the paper the distribution and rock constitution of the ridges are described. I noted that continental matter exists in the oceanic basins. The second section contains var hypotheses on the origin of these sub-oceanic ridges. It is concluded that the clear analo between the shapes of the main sub-oceanic ridges and the opposed continental outlines are explained under the hypothesis of continental drift. *Subject Headings:* **1. Submarine to raphy 2. Continental drift 3. Oceanic ridges.**—*I.S.*

12M–273 551.462(

Limbaugh, Conrad and Shepard, Francis P. (*both, Scripps Inst. of Oceanog., La Jolla, Ca* **Submarine canyons.** *Geological Society of America, Memoir,* No. 67, Vol. 1:633–639, **1957.** map, plate, 12 refs. **DLC** (QH542.N3)—The peculiar stream-valley characteristic some of the best known canyons such as the La Jolla and the Scripps Canyon, Calif. are desc The observations were made by aqualung divers at 50–100 m depth, and photos taken there presented. Sandslides and deterioration of the rock walls may partially be due to boring digging of animals inhabiting the canyons. *Subject Headings:* **1. Submarine canyons 2. Jolla, Calif. 3. Scripps Canyon, Calif. 4. Pacific Ocean.**—*W.N.*

12M–274 551.462.34:551.353:551

Laughton, A. S. (*Nat'l. Inst. Ocean. Wormley, Eng.*), **The exploration of an interp deep-sea channel.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of stracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 36–38. 2 figs. In English and Fre **DWB** (551.46082 I61pr)—A channel was found through the mountainous sill which sepa the Biscay and Iberian Abyssal plains and was explored in July 1958 by R.R.S. Discover The channel varies in depth from 1 to 4 mi and is 50 mi long. Profiles of interplain cha are shown. The features of the channel verify the theory that the abyssal plains are covere turbidity current deposits and that after traveling many hundreds of miles over an abyssal these currents are capable of being rejuvenated. *Subject Headings:* **1. Deep-sea channel Turbidity currents 3. Abyssal plain deposits.**—*I.S.*

12M–275 55

Laughton, A. S. (*Natl. Inst. of Oceanog.*), **Exploring the deep ocean floor.** *Royal So of Arts, Journal,* 106:39–56, Dec. **1957.** 9 figs. **DLC.** Reprinted as *National Institut Oceanography Wormley, Surrey, England, Collected Reprints,* 6(22), Dec. **1958. DWB**— aim of sea floor exploration is to make a topographic survey to form a framework for other stu The sea floor will be characterized on a regional basis. Instruments and methods of study incl depth soundings, photography and collection of specimens are described. Thus far, geographica dence suggests that the oceans are much older than Cretaceous (WEGENER) and have not al radically since the crust cooled and solidified. There appear to be no major differences bet the structure of the crust under the Atlantic and Pacific. Some results of a study cruise by R.R.S. "Discovery II" run by the National Institute of Oceanography and the Departme Geodesy and Geophysics at Cambridge are given. *Subject Headings:* **1. Submarine topogr 2. Oceanographic programs 3. Oceanographic cruise data 4. Oceanographic equip** —*E.Z.S.*

12M–276 551.462

Lisitsin, A. P. and Zhivago, A. V., **Rel'ef dna i osadki iuzhnoĭ chasti Indiĭskogo ok (Soobshchenie 2-e).** [Bottom relief and sediments of the southern part of the Indian C Pt. 2.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geograf.,* No. 3:22–36, May/June 1958 figs., table, 13 refs. **DWB**—The article is devoted to the description of material obtained d the second voyage of the Maritime Antarctic Expedition that covered a large portion o Indian Ocean adjacent to the Antarctic. The description is divided into several parts: b sediments in general with the network of stations made; terrigenous, volcanic, organic chemical sediments are described in detail, as well as red deep sea clay. The article co four schematic charts of the southern Indian Ocean. *Subject Headings:* **1. Submarine t raphy 2. Marine sediments 3. Southern Indian Ocean.**—*B.J.G.*

12M–277 551.462:551.353

†Menard, Henry W. (*Scripps Inst. of Oceanography, La Jolla, Calif.*), **Distribution et igine des zones plates abyssales.** [Distribution and origin of flat abyssal zones.] (In: rance. Centre National de la Recherche Scientifique, **La topographie et la géologie des pro- ndeurs océaniques.** Paris. **1959.** p. 95–108. 3 figs., table, 24 refs. English summary p.) **DLC** (GC83.F7)—Three classes of topography of low relief may be distinguished in the acific: 1) a very widespread and characteristic hilly terrain, 2) smooth abyssal plains off the ntinent in the northeastern Pacific, and 3) smooth archipelagic aprons around the island oups of the western and southern Pacific. Similar topography exists in other oceans. The nooth areas apparently are formed by burial of a pre-existing hilly terrain. Sediment derived om continents and apparently spread by turbidity currents is the dominant material that nooths abyssal plains. Volume-wise, lava flows appear to be dominant in forming archipelagic rons, but sediment is required to perfect the smoothing. Preliminary estimates suggest that the tal areas of abyssal plains and archipelagic aprons in the world are roughly equal. The total ea of known smooth deep sea floor in the Pacific is greater than in the Atlantic because of the ntribution of archipelagic aprons. However, the proportion of the Atlantic sea floor (below 00 m) that is smooth is greater than the Pacific. Smoothing by settling out of pelagic material comparatively unimportant. *Subject Headings:* **1. Submarine topography 2. Sedimentary ocesses on the sea floor 3. Pacific Ocean 4. Atlantic Ocean.**—*Author's abstract.*

12M–278 551.462:562.2:539.1:551.556.8:551.465:532.59

Munk, Walter H. and Sargent, Marston C., **Adjustment of Bikini Atoll to ocean waves.** *S. Geological Survey, Professional Paper* 260-C (i.e., Ch. C of Pt. 2 of its **Bikini and nearby olls), 1954.** p. 275–280. figs. 91–93, 2 tables, 9 refs. **DGS, DWB** (M(055) U582pr)— olls in the trade-wind belt withstand a continuous heavy pounding from ocean waves. Against windward side of Bikini Atoll alone it is estimated that waves dissipate 500,000 horsepower, e-fourth the power generated at Hoover (Boulder) Dam. To withstand these forces, the posed reefs are molded into a most effective natural breakwater, consisting of long narrow grooves the seaward face of the reef, and surge channels on the reef flat. These surge channels are ned to the prevailing wave periods. Their distribution around the reef conforms to the dis- bution in wave activity, which in turn is controlled by prevailing winds over the north and uth equatorial Pacific. Some of the power of the breaking waves is utilized to maintain a ter level just inside the surf zone about 1.5 ft above the general sea level. The water flows wnhill over the reef into the lagoon, regardless of the stage of the tide, with an average speed 0.5 to 1.0 knot, but occasionally with speeds up to 4 knots. The reef as a biological com- nity utilizes this current and maintains thereby a wave-resisting and modifying structure. *bject Headings:* **1. Ocean wave effects 2. Atolls 3. Bikini Island.**—*Authors' abstract.*

12M–279 551.462:001.4(265/266)

Muromtsev, A. M., **Nomenklatura osnovnykh form rel'efa dna Tikhogo okeana.** [Nomen- ture of the basic forms of the bottom relief of the Pacific Ocean.] *Moscow. Gosudarstvennyĭ eanograficheskiĭ Institut, Trudy,* No. 48:86–94, **1959.** figs., charts. Russian and English sum- ries p. 94. **DWB**—Determination of the character and designation of separate forms of relief the bottom is of great scientific significance. The relief of the bottom of the Pacific Ocean, ich is noted for its complexity, has no complete, uniform, nomenclature. Various attempts de in naming and classifying deep sea features are enumerated and described. A schematic art of the Pacific Ocean floor features is presented. The overall characteristics are discussed. llowing the discussion, a table of proposed designations for positive and negative forms of ief is presented. The table contains names proposed by the International Committee, the arine Atlas and the Atlas of the World. Recommendations for adoption of fixed designations made. The summary states that the nomenclature suggested may be considered as a basis developing a uniform international nomenclature. *Subject Headings:* **1. Submarine topog- phy 2. Nomenclature 3. Pacific Ocean.**—*B.J.G.*

12M–280 551.468:551.556.8:551.465:551.351

Nakano, Masito (*Met. Res. Inst., Tokyo*), **A problem concerning the vertical circulation sea water produced by winds with special reference to its bearing on submarine geology d submarine topography.** (In UNESCO Symposium on Physical Oceanography, Tokyo, Oct. 55, **Proceedings,** pub. **1957.** p. 107–111. 2 figs., 4 refs. French summary p. 107) **DWB** Vertical circulation induced by winds may change the depth of shallow seas or bays by the nsport of loose deposit along the sea bed. The filling up of the Isohama Harbor is cited as example. The grain size of the bed load has a bearing on the change in depth. A mathe- tical analysis is given for the condition in small bays. *Subject Headings:* **1. Vertical circula-**

tion of sea water 2. Wind effects on shallow water 3. Sediment transport 4. Isoh Harbor, Japan.—*E.ZS.*

12M–281 551.46

Northrop, John; Blaik, Maurice and Frassetto, Roberto, **Bathymetry of the Gibbs Hill** **Bermuda.** *Deep-Sea Research,* New York, 5(4):290–296, May **1959.** 5 figs., 22 refs., **DWB**—Precision depth recordings were made South of Gibbs Hill, Bermuda, along a numb closely spaced sounding tracks. The accuracy of transit navigation and the sounding cove were considered sufficient to justify correcting the soundings for both sound velocity and s The corrected soundings show that a steep sided submarine spur extends south-south-east from shelf break off Gibbs Hill. The spur has a topographic relief of 300 fm and is about 3 mi and ½ mi wide. At the 1000 fm curve, the feature broadens into a platform that extends an 12 mi seaward to the 2000 fm curve. True slopes along the steep portion of the spur ar high as 50° and the bottom echoes appear to be from a number of highlights causing "cresc on the record. Where a definite break in slope occurs, the apparent bottom shown on bathygram is that of a diffraction pattern from an edge and all points on this crescent mi to a point, which is the true position of the break in slope. *Subject Headings:* **1. Subma topography 2. Gibbs Hill, Bermuda.**—*Authors' abstract.*

1M2–282 551.462.62:551.3

Northrop, John; Frosch, R. A.; Frassetto, R. et al., **The Bermuda-New England Seam chain.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of pa* Issued Wash., D. C., AAAS, **1959.** p. 48–49. French summary p. 49. **DWB** (551.4 I61pr)—From the continental slope off Massachusetts to Bermuda a series of seamounts ex in an arc 1000 mi long. This chain can be classified into three physiographic provinces: tinental Rise Seamounts, Abyssal Plain Seamounts, and Bermuda Rise Seamounts. In ge the seamounts are roughly oval in plan and their flanks are concave upward. The details of physiographic features are presented in tabular form. *Subject Headings:* **1. Submarine to raphy 2. Seamount chains 3. Continental Rise Seamounts 4. Abyssal Plain Seam 5 Bermuda Rise Seamounts 6. Western Atlantic Ocean. I. Zeigler, J. M.**—*I.S.*

12M–283 551.462(

Paisley, J. T. K., **Survey of a seapeak in the Mozambique Channel.** *Deep-Sea Rese* London, 3(2):145–149, Feb. **1956.** 3 figs. **DLC**—Discovery of a seapeak, a hitherto unk bottom feature in the Mozambique Channel by H.M.S. "Dalrymple" in Sept. 1954 is desc Charts and profiles of the soundings are presented. *Subject Headings:* **1. Submarine topogr 2. Mozambique Channel.**—*G.T.*

12M–284 551.462.52:551.464(

†Richards, Francis A. and Vaccaro, Ralph F., **The Cariaco Trench: an anaerobic bas the Caribbean Sea.** *Deep-Sea Research,* London, 3(3):214–228, April **1956.** 5 figs., 2 t 31 refs. **DLC**—The Cariaco Trench is a basin in the Caribbean Sea which is anaerobic depths of about 375 m to the bottom at 1400 m. Below ca. 250 m the water is essen isothermal at about 16.9°C and has practically uniform salinity and density. Hydrogen s reaches maximum concentrations of .03 mgA sulfide S per liter, which is about 10% of the centration found in the depths of the Black Sea. Inorganic phosphate is linearly related t oxygen and sulphate consumption in a ratio equivalent to 235 atoms of oxygen utilized fo production of 1 atom of phosphate. The anaerobic zone is free of nitrate and nitrite, but ammonia is present. It is suggested that most of the nitrogen arising from decompositi organic matter is present as elementary N_2 in solution. The age of the water is estimated between 100 and 2000 yrs. The physical properties of the trench are compared with tho other isolated basins. *Subject Headings:* **1. Chemistry of sea water 2. Anaerobic b 3. Cariaco Trench 4. Caribbean Sea.**—*Authors' abstract.*

12M–285 551.462:551.351.3:537.531

Schmalz, Robert F. and Zen, E-An, **Quantitative modal analysis of sediments by diffraction.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstra papers.* Issued Wash., D. C., AAAS, **1959.** p. 485–486. German summary p. 486. **DV** Two methods developed for the quantitative x-ray analysis of fine-grained sediments ar scribed. These methods are based upon the theory proposed by Hull (1919) and later deve in detail by Alexander and Klug (1949). The first method measures the heights of se diffraction peaks by fixed-time counting and step-scanning, using aluminum as internal sta The other method uses thoria or quartz as internal standard, and measures the total areas osen peaks planimetrically. The details of the application of both methods to the analysis of nples from 36 cores collected by "Atlantis" from the Peru-Chile Trench are presented. *bject Headings:* **1. X-ray diffraction analysis 2. Norelco Geiger counter x-ray diffrac-neters 3. Peru-Chile Trench 4. Pacific Ocean.**—*I.S.*

12M–286 551.462(262)

Segre, Aldo (*Istituto geologico, Rome*), **Observations générales sur l'orographie sous-irine de la mer Tyrrhénienne.** [General observations on the deep-sea orography of the rrhenian Sea.] (In: France. Centre National de la Recherche Scientifique, **La topographie la géologie des profondeurs océaniques.** Paris, **1959.** p. 53–59. 3 figs. English sum-ry p. 53.) **DLC** (GC83.F7)—The observations were completed during the cruises of the ssels "Staffetta" (Italian Navy, Hydrographic Service) and "Vema" (Lamont Geol. Observa-y). A general sketch of the orography of the seamounts in the Tyrrhenian basin shows the tribution of the facies (serpulidae and briozoa; brachiopoda; deep madreporarian associations, .). A big seamount between southern Italy and the north Sicilian islands was the object of more particular exploration, and an outline of this kind of mountain is exposed; flattened nmit with scattered peaks built out of effusive rocks; slopes in the same zone, some as seats rapid or slowly sliding phenomena related to crustal displacement of isostatic origin. Its eistocene character is evidenced by strong lithobiofacies changes as observed through dredgings l cores obtained from the top. Around this seamount some depressions were observed at the ttom, probably of subsidence origin. These depressions have either an annular disposition or gitudinal direction along a depression, like a large valley. The abyssal region NE of the lian Islands is a plain on which arise some scattered volcanic seamounts; some perfectly flat eas extend to a length of more than 15 naut. mi. A particularly small trench has been noted ng the border of abyssal hills which is of possible tectonic origin, and forms the limit of the yssal basins. The appearance of the gravimetric (isostatically corrected) profile, of this moun-n is described, based on the few known measurements. *Subject Headings:* **1. Submarine oography 2. Seamounts 3. Tyrrenhenian Sea.**—*Author's abstract.*

12M–287 551.465:551.462.34:551.35

Shepard, Francis P. (*Scripps Inst. Oceanog., La Jolla*), **Turbidity currents and erosion the deep sea floor.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of stracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 50–51. fig. French summary p. 51. **WB** (551.46082 I61pr)—Claims in favor of the erosion capacity of turbidity currents relative the formation of submarine canyons and the channels of the deep ocean floor are open to estion. The cable breaks in 1929 on the gentle slopes outside the Grand Banks, often cited as dence of such erosion, may have other interpretations. *Subject Headings:* **1. Turbidity cur-nts 2. Submarine canyon formation.**—*I.S.*

12M–288 551.462

†Udintsev, G. B., **Novye dannye o glubinakh okeanicheskikh zhelobov.** [New data on depths of oceanic trenches.] *Akademiia Nauk SSSR, Doklady,* 129(3):666–669, **1959.** table, refs. Transl. into English in the corresponding issue of its *Soviet Physics, Doklady,* N. Y. **LC**—Using the most recent studies on the maximum depth of ocean trenches carried out by the stitute of Oceanography of the Academy of Sciences of the U.S.S.R. (N. L. Zenkevich, V. F. anaev, N. I. Larina, etc.), published data in the foreign literature, and the hitherto unpublished servations of the "Vitiaz" expedition, the author has constructed a table summarizing the data maximum depths of ocean trenches. The divergence of the latest measurements from earlier es, the definition of oceanic trenches, etc. are discussed. *Subject Headings:* **1. Ocean enches 2. Submarine topography.**—*I.L.D.*

12M–289 551.462:551.353(265/266)

Udintsev, G. B. (*Inst. Oceanog., Acad. Sci., Moscow*), **Relief of abyssal trenches in the cific Ocean.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts papers.* Issued Wash., D. C., AAAS, **1959.** p. 54–57. In English and Russian. **DWB** 51.46082 I61pr)—The work carried out by the Institute of Oceanology of the U.S.S.R. Academy Sciences on the "Vitiaz," covering more or less all the trenches along the margins of the stern Pacific Ocean, is reported. The results of the Soviet investigations include much new formation on the configuration and sizes of abyssal trenches in the Pacific Ocean, and informa-n pertaining to similar features in the morphology of all trenches. Detailed information on maximum depths of the trenches has also been obtained. *Subject Headings:* **1. Ocean enches 2. Submarine topography 3. Western Pacific Ocean.**—*I.S.*

12M–290 551.462:551.353:551.

Udintsev, G. B. (*Inst. Oceanog., Acad. Sci., Moscow*), **Relief of the sea bottom and q tions of tectonics.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstr of papers.* Issued Wash., D. C., AAAS, **1959.** p. 57–59. In English and Russian. **D** (551.46082 I61pr)—Recent data indicate that large forms of submarine relief and struct of the crust do not completely correspond. Ocillatory movements of the crust are compens for by masses of sediments within the oceans, which does not permit the primary tectonic r to be preserved in its original shape. Wave action, abyssal and bottom currents, periodic bidity flows and permanent currents play an important part in the uneven accumulation of s ments, in sharp fluctuations in the thickness of sedimentary masses and in the leveling rol sedimentation. *Subject Headings:* **1. Submarine topography 2. Tectonic influences on marine topography.**—*I.S.*

12M–291 551.462:550.3

Vacquier, Victor (*Scripps Inst. Oceanog., San Diego, Calif.*), **Measurement of horizo displacement along faults in the ocean floor.** *Nature,* London, 183(4659):452–453, Feb. 1959. fig., 3 refs. **DLC**—A survey was made by Scripps Institution of Oceanography in eastern Pacific along the Murray Fracture Zone and the Pioneer Ridge (38° 30′N lat. and betw 127° and 136°W long.) They measured the direction and amount of horizontal slip and f a left lateral displacement of 138 naut. mi. Profiles of total magnetic intensity on both sides parallel to the Pioneer Ridge fault are given. The mobility of blocks of oceanic crust unsuspected. *Subject Headings:* **1. Submarine topography 2. Magnetic profiles 3. Mu Fracture Zone 4. Pioneer Ridge 5. Eastern Pacific Ocean.**—*W.N.*

12M–292 551.351:551

†Wells, John W. (*Cornell Univ., Ithaca, N. Y.*), **Coral reefs.** *Geological Society of Ame Memoir,* No. 67, Vol. 1:609–631, Dec. **1957.** 2 figs., map, 8 plates, 37 refs. **DLC** (QH542 —Problems discussed include physical, chemical and biological aspects related to the developm maintenance and decay of coral reefs. Biogeographical studies were made of reefs in the I Pacific and the tropical Atlantic Oceans. Generally reefs require temperatures within 23– for development although they may exist below 18°C in some parts of the 190,000,000 sq they occupy. Whether a given reef is flourishing, static or decadent is difficult to deter conclusively. A map showing the distribution of reefs and their relation to sea surface tem ture is presented. *Subject Headings:* **1. Coral reefs 2. Temperature of sea water 3. I Pacific Ocean 4. Tropical Atlantic Ocean**—*W.N.*

12M–293 551.462(

Wiseman, John D. H. and Hall, G. P. D., **Two recently discovered features on the of the Indian Ocean, Andrew Tablemount and David Seaknoll.** *Deep-Sea Research,* Lon 3(4):262–265, Sept. **1956.** 6 figs. (fold.), 5 refs. **DLC**—The results of recent su of Andrew Tablemount with a least depth of 850 fm in 06°45.3′N, 50°29.5′E, and David knoll with a least depth of 935 fm in 06°23.5′N, 50°14.75′E, are given. The basis of the su of Andrew Tablemount was a radar-reflecting beacon anchored at a depth of 870 fm in 06°48 50°27.1′E. The survey of David Seaknoll was carried out by dead reckoning (adjusted f set of 0.56 knot in a 263° direction), because the radar-reflecting beacon failed to withsta gale. *Subject Headings:* **1. Submarine topography 2. Seamounts 3. Indian Oce** *Authors' abstract.*

12M–294 55

†Zeigler, J. M.; Athern, W. D. and Small, H., **Profiles across the Peru-Chile Tr** *Deep-Sea Research,* London, 4(4):238–249, 1957. 9 figs., 24 refs. **DLC**—Three general of profile across the Peru-Chile Trench are shown: trench with gently basined topography, t with smooth flattish floor, and trench with abrupt topography. Differences in trench shap ascribed to differences in agents and rates of sedimentation. Production of plankton w skeletons might accumulate as bottom sediment is reasonably uniform along the length o area examined, therefore differences in sedimentation must be associated with available s from the South American continent. Presumably the supply would be greater north o Chilean desert because more streams reach the sea and in some places, such as near Talara, the coastal sediments are less resistant than the volcanics along much of the Chilean coas the trench is not the same age throughout its length, then the arguments for different sedime environments do not necessarily explain differences in bottom topography, no from profiles is it possible to say which end of the trench is younger; however a progressively growing

xure must then be assumed. Topographic features such as subsidiary trenches to the side the main trench, grabens and horsts, and submarine canyons are described. *Subject Headings:* **Peru-Chile Trench profiles 2. Submarine topography 3. Pacific Ocean.**—*Authors' abstract.*

12M–295 551.462:778.3(265/266)

Zenkevich, N. L. (*Inst. Oceanog., Acad. Sci., Moscow*), **Methods and some results of** **otographing the floor of the Pacific Ocean.** *International Oceanographic Congress, 1st,* *. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 493–495. English and Russian. **DWB**—There has been considerable development in the technique of bmarine photography since 1953 when in the Kurile Islands region the first experiments in otographing the sea floor at great depths with automatic cameras were carried out on the 'itiaz." The improved techniques of photography and some of the results of photographing e floors of the Pacific Ocean aboard the "Vitiaz" are described. In all, 400 pictures of the ttom were obtained at 55 stations in the Pacific Ocean. The stations were chiefly along 154°E d 174°W and along the Tropic of Cancer. The photographs have provided valuable informa- n about the types of sediments and forms of submarine relief. *Subject Headings:* **1. Sub- arine photography 2. Submarine topography 3. Pacific Ocean.**—*I.S.*

12M–296 551.462(267)

Zhivago, A. V. (*Inst. Geog., Acad. Sci., Moscow*), **Types of bottom relief in the southern** **dian Ocean.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts* *papers.* Issued Wash., D. C., AAAS, **1959.** p. 64–66. In English and Russian. **DWB** 51.46082 I61pr)—Results of geomorphological research during the Antarctic voyage of the)b" (1955–1958) on the bottom relief in the southern Indian and Pacific Oceans are reported. om echograms the relief of the ocean bottom from the Antarctic continent up to 30–40° S.L. as established. Special features of the continental shelf, the continental slope, and of the ocean or are described. The bottom relief as well as bottom volcanism in the Indian and Pacific ceans are Recent. The volcanism is continuing at the present time. *Subject Headings:* **1. bmarine topography 2. Submarine volcanism 3. Southern Indian Ocean 4. Pacific cean.**—*I.S.*

MARINE SEDIMENTS

See also: **Soviet success in oceanog.** (Janiszewski), 12M–35; **83 Colloquim, Nice 1958,** 12M–49; **Relief and bottom sediments, Arctic** (Belov), 12M–254; **Floor of the Arctic** (Hunkins), 12M–270; **Bottom relief and sediments, Indian Ocean** (Lisitsin, Zhivago), 12M–276; **Submarine geology and topography** (Nakano), 12M–280; **Analysis of sediments** (Schmalz, Zen), 12M–285; **Investigations of ocean bottom** (Sysoev et al.), 12M–357; **Sediments off Coast of Nice** (Boucart et al.), 12M–425; **Bottom of Cadiz Bay** (De las Heras et al.), 12M–427; **Bottom water, German Baltic Coast** (Groba), 12M–430; **Composition of sea water** (Goldberg), 12M–670; **Boron in sediments** (Landergren), 12M–678; **Lead isotopes in marine sediments** (Chow), 12M–700; **Pigments in marine sediments** (Laevastu), 12M–775; **Acoustic properties of sediments** (Shumway), 12M–810; **Sediments in Northwest Pacific** (Bruevich), 12M–949.

12M–297 550.4:551.352:551.462:551.352

†Arrhenius, Gustaf O. S. (*Scripps Inst. of Oceanog.*), **Sedimentation on the ocean floor.** *esearches in Geochemistry,* (issued by) John Wiley & Sons, Inc., 1959. p. 1–24. 11 figs., 47 fs. Reprinted as *California. Univ. Scripps Institution of Oceanography, Contributions,* **59,** issued **1960.** p. 1199–1222. **DWB** (551.46 C153co)—Minerals accumulating on the ocean or from suspension or solution in sea water have their origin in all the geospheres and in outer ace. Owing to differences in physicochemical processes involved in the formation of solids in e lithosphere, the hydrosphere, the biosphere, the atmosphere, and extraterrestrial space, the urce of sedimentary minerals can often be determined from their isotopic or elemental composition, ystal structure, or other characteristics properties. Variations in the rate and type of con- bution from these different sources can be traced to the sedimentary record, and they yield formation on the geological history of the earth. Events that have a global or wide regional ect and a duration in time of the order of 10^3 years or more are particularly well registered in e pelagic deposits, and in favorable cases can be quantitatively reconstructed. *Subject Head- gs:* **1. Minerals on the sea floor 2. Geological history of earth 3. Marine sediments.**— *uthor's introduction.*

12M–298 551.462:551.351.3(2

Bezrukov, P. L. and Petelin, V. P. (*both ANSSSR, Oceanog. Inst.*), **The bottom sedime of the trenches in the West Pacific Ocean.** *International Oceanographic Congress, 1st, N. 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 451–454. English and Russian. **DWB** (551.46082 I61pr)—Investigations by the "Vitiaz" of the Insti of Oceanography, Academy of Sciences of the U.S.S.R. during 1953–1958 of twelve tren in the West Pacific Ocean are briefly reported. The data obtained during the course of inv gations consisted of nearly 60 bottom sediment samples and several of suspended material of near-bottom waters from trenches at various depths. The characteristics of the trenches discussed. Similarities of the bottom deposits in the trenches related to the general geolog structure and morphology of the trenches, are described. The sedimentation characteris related to climate are also presented. *Subject Headings:* **1. Sediments in oceanic tren 2. West Pacific Ocean.**—*I.S.*

12M–299 551.462:551.3

Bezrukov, P. L. (*Inst. Oceanog., Acad. Sci., Moscow*), **Problems of zonation in sedime tion.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of pa* Issued Wash., D. C., AAAS, **1959.** p. 448–451. In English and Russian. **DWB** (551.4 I61pr)—A brief review of the problem of zonation of sediments in the oceans based on the data obtained by oceanographic expeditions during post-war years. The new data make it pos to establish a definite zonation in the distribution of recent sediments, volcanic, climatic, hy metric, and circumcontinental. Three types of zonation reflect laws which govern the cha in the sediments on the bottom. *Subject Headings:* **1. Sediment distribution zones 3. Ma sedimentary facies.**—*I.S.*

12M–300 551.353:551

*Borghetti, Giorgio, **Caratteristiche meccanico-fisiche di alcuni sedimenti recenti del G di Genova.** [Physico-mechanical characteristics of some recent sediments in the Gulf of Ge *Geofisica e Meteorologia,* Genoa, 7(1/2):29–36, Jan./April **1959.** 6 figs., 7 tables, 5 English summary p. 36. **DWB**—Granulometric analysis of 35 samples of sediments collecte the Gulf of Genoa, at depth from 10 till 105 m, have been made and the results are prese using different synthetic methods of representation. From these results it is inferred that limit of the actual sedimentation of the material removed by the surf is located at a dept nearly 90 m and at a distance of 5–5.5 km from the coast of Voltri-Pra. *Subject Headi* **1. Recent marine sediments 2. Gulf of Genoa.**—*Author's abstract.*

12M–301 525.6:551.465:532.59:551.

Cartwright, D. E. and Stride, A. H. (*Natl. Inst. Oceanog., Wormley*), **Large sand w near the edge of the Continental Shelf.** *Nature,* London, 181:41, Jan. 4, **1958.** fig. Reprinted as *National Institute of Oceanography, Wormley, Surrey, England, Collected Rep* 6(233), Dec. **1958.** **DWB**—Sand waves normal to tidal streams and parallel to the general of the edge of the continental shelf were found on La Chapelle Bank (47°41′N, 7°13′W means of echo sounding at 90 fms during cruises of R.R.S. "Discover II" and R.V. "Sa Sand with some shell and gravel were the chief components of the sand waves. A slight a metry of their profiles allows the inference that there must be a net westward transport of ment. The abrupt western limit of the sand waves at the edge of the shelf may mean tha material, once it reaches the top of the continental slope, is carried away into deeper w *Subject Headings:* **1. Sand waves 2. Sand transport 3. Marine sediment transport 4 Chapelle Bank, Eng.**—*E.Z.S.*

12M–302 551.462:551.352:55

Chow, Tsaihwa J. and Patterson, Claire C. (*both, Geol. Sci. Calif. Inst. Tech.*), **The iso composition and concentration of lead in pelagic sediments and manganese nodules.** *I national Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* I Wash., D. C., AAAS, **1959.** p. 497–499. In English and French. **DWB**—Results of an of pelagic clay cores and of manganese nodules from the Atlantic and Pacific Oceans ar scribed. The analysis was designed to determine the concentration and isotopic compositio lead in the cores. The concentration of lead ranged between 15 and 40 ppm in a dozen At cores and showed no correlation with collecting sites. The concentration of lead in one o several Pacific cores analyzed averaged 30 ppm in the upper part, but in the lower part it incr four-fold. The lead in the manganese nodules was found to have the same isotopic compo as the lead in the surrounding pelagic sediments. *Subject Headings:* **1. Lead isotopic com tion in marine sediments 2. Pelagic sediments 3. Manganese nodules 4. Atlantic C 5. Pacific Ocean.**—*I.S.*

12M–303 551.462:551.352/3(262)

Di Napoli Alliata, Enrico, **Étude de la carotte No. 19 campagne du "Vema" dans la éditerranée (Mer Tyrrhénienne).** [Study of core No. 19, "Vema" expedition in the Medi-rranean (Tyrrhenian Sea).] In: France. Centre National de la Recherche Scientifique, **La pographie et la géologie des profondeurs océaniques.** Paris, **1959.** p. 61–71. 41 refs. omments by A. G. Segre p. 69–70. English summary p. 61.) **DLC** (GC83.F7)—We sum-arize the results of the micropaleontological study of the core No. 19 (2.90 m thick) taken by e "Vema" expedition in the Tyrrhenian Sea off the Cape Palinuro (Gulf of Policastro). The re was represented by:

0– 5 cm: blue muds with pelagic Forams;
5– 83 cm: coquinoids limestone with Serpula, Bryozoa, Mollusca and Forams, with small intercalations of yellowish mud with pelagic Forams and Pteropoda;
83–150 cm: Green and reddish mud and Galuconite with moulds of pelagic Forams, rare sponge spicules;
150–253 cm: dark mud and sand in the lower part with pumice and vulcanic scoriae; abundant spunge spiculas; rare moulds of pelagic Forams;
253–290 cm: green sand and calcarenite with abundant debris of Pelecypods, Gastropods, Bryozoa, rare Serpula and Echinoids; frequent benthonic Forams.

urther detailed descriptions of the micropalentological samples taken from core No. 19 are given. *ubject Headings:* **1. Marine sediment cores 2. Tyrrhenian Sea 3. Mediterranean Sea.**—*rom author's abstract.*

12M–304 551.462:551.351.3(268)

Donn, W. L.; Ewing, M. and Menzies, R. J. (*all, Lamont Geol. Obs., Palisades, N. Y.*), **haracteristics of the late Quaternary Arctic Ocean.** *International Oceanographic Congress, st, N. Y., 1959, Preprints of abstracts of paper.* Issued Wash., D. C., AAAS, **1959.** p. 19–20. n English and French. **DWB** (551.46082 I61pr)—Observers from the Lamont Geological bservatory have obtained cores, dredge and grub samples, bottom photographs and water samples rom Drifting Station "A." The data suggest that the Arctic Ocean has been ice covered during e Recent epoch. Much of the sand and the fragmental rock material came from the peripheral ontents and islands during an interval of open water, probably predating the Recent. The data lso suggest a very slow rate of sedimentation. *Subject Headings:* **1. Quaternary deposits . Drifting Station A 3. Arctic Ocean.**—*I.S.*

12M–305 551.352:551.462:546.79:551.461.8

Emiliani, Cesare (*Enrico Fermi Inst. for Nuclear Studies, Chicago*), **Oxygen isotope meas-rements of deep-sea sediments.** *National Research Council, Wash., D. C., Publication,* No. 73:67–78, **1957.** 3 figs., 3 tables. **DWB** (551.46 N277pr), **DLC** (GC57.N33, 1956)—The nrico Fermi Institute for Nuclear Studies in Chicago uses a method based on the oxygen isotope nalyses of shells of pelagic Foraminifera to study ocean cores. Through this investigation the espective ages of the cores and the varying temperatures of the sea-bottom have been estimated *ubject Headings:* **1. Oxygen isotope measurements 2. Marine sediment cores.**—*N.N.*

12M–306 551.462:551.351:561.2(268)

†Ericson, David B. and Wollin, Gosta, **Micropaleontology and lithology of Arctic sediment ores.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers,* No. 63, ol. 1, Sept. **1959.** p. 51–58, 2 figs., 24 refs. **DWB, DLC**—An analysis of seven Arctic sedi-ent cores is given. An examination of the coarse fraction of the samples shows the mineral nd organic elements. The sediments can be divided into (1) sediment of slow, particle by particle ccumulation, (2) glacial marine sediment, (3) sediment deposited by turbidity currents. *Subject eadings:* **1. Sediment cores 2. Ocean floor stratigraphy.**—*A.H.K.*

12M–307 551.465:551.351.3

Ericson, David B. and Heezen, Bruce C. (*both, Lamont Geol. Obs.*), **Distribution of fine ediment as an indication of deep current direction.** *International Oceanographic Congress, st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 454–56. 2 figs. In English and French. **DWB** (551.46082 I61pr)—How distribution of fine sedi-ents can be utilized to find out the direction of transport of deep currents is the subject of this aper. The existence of a definite relationship between deep currents, fairly constant in direction ver extended periods of time, and the distribution of sediment is indicated. This is illustrated by resenting a diagram showing the locations of two cores with respect to the Muir seamount 33°42′N, 62°30′W). The sediment of the cores are analyzed and the direction of the associated eep current is determined. *Subject Headings:* **1. Submarine erosion and transport 2. Sedi-entary processes on the sea floor.**—*I.S.*

12M–308 551.464:551.352:546

Goldberg, Edward D. and Koide, Minoru (*both, Scripps Inst. of Oceanog., Calif.*), **Ioni**
thorium chronology in deep-sea sediments of the Pacific. *Science*, Wash., D. C., 128(333
1003, Oct. 24, **1958.** table, 4 refs. **DLC**—The ratio of ionium to thorium varies exponenti
with depths in deep sea sediments of the Pacific Ocean and gives rates of accumulation of
order of millimeters per thousand years. Surface values of the ratio were not constant
the eastern Pacific Ocean. This condition may result from differences in thorium isotope
centrations in near shore bottom waters which furnish these isotopes to the sediments. *Sub*
Headings: **1. Marine sediments 2. Thorium in marine sediments 3. Pacific Ocean.**—*N*

12M–309 551.462:551.351:551.4

†Guilcher, André (*Institut de Géographie, Paris*), **Les accumulations sous-marine du plat**
de Molène et de la chaussée de Sein (Finistère). [Submarine deposits on Moldène pla
and Sein shoals, Finistère.] (In: France. Centre National de la Recherche Scientifique,
topographie et la géologie des profondeurs océaniques. Paris, **1959.** p. 109–141. 13 f
5 photos., 4 tables, 33 refs. English summary p. 109.) **DLC** (GC83.F73)—Molène and
shoals are aprons with numerous scattered skerries and islets in front of Western Brittany. V
strong tidal currents (up to 9 knots at spring tides in some narrows) alternately run tow
the English Channel (flood) and towards the Bay of Biscay (ebb), but in some cases the f
is stronger than the ebb or inversely. Under these conditions, deposition of sand and grave
possible, and the underwater «dunes» are found on the shoals especially in places where the
rent velocity decreases, at the opening of the straits. These dunes include longitudinal str
shapeless deposits in quiet zones, parabolic dunes, barchans, Z-shaped dunes, giant ripples
Zostera meadows and small ripples. Concerning the analysis of the deposits, the calcium
bonate content, which is exclusively skeletal, is generally poor in high beaches, and incre
with depth. *Lithothamnion calcareum*, the so-called «maërl», plays a major part in many
marine deposits. The coarsest gravels are found below the low water-mark. Several gr
are distinguished. Quartz particles in sands are poorly rounded, although noticeable differe
in roundness exist. With regard to pebbles, rounding is in progress on some banks where t
currents are exceptionally strong, but in most places old pebbles, formerly rounded at other le
are now covered with *Lithophylum*. Finally, the determining influence of the local environm
is pointed out: the characteristics of the deposits in a given place may be wholly different f
the mean characteristics at the same depth, as a consequence of local conditions. *Subject H*
ings: **1. Marine sedimentary facies 2. Western Brittany 4. English Channel 4. Bay**
Biscay.—*Author's abstract.*

12M–310 551.353:55

†Heezen, Bruce C. (*Lamont Geol. Obs.*), **Dynamic processes of abyssal sedimentati**
erosion, transportation, and redeposition on the deep-sea floor. *Geophysical Journal*, Lon
2(2):142–163, June **1959.** Bibliog. p. 159–163. **DWB, DLC**—The concept of a quiet, ne
motionless, and certainly currentless deep-sea floor lacking the processes of erosion so preva
in shallower seas was well ingrained in scientific thought until discoveries of the past de
revised this serene and static picture. The new concept is a more dynamic one in which
marine landslides, raging turbidity currents, international tides, deep-sea current scour, and
marine post-depositional solution and alteration play a part in shaping the sea floor, in distur
and nurturing its fauna and which produce sedimentary structures and distributions form
thought to be the exclusive mark of shallow water deposits. The concepts involved are stil
a critical state of flux with many conflicting viewpoints as to the processes involved and t
relative importance. The development of the major concepts is traced and the principal var
viewpoints are briefly reviewed. *Subject Heading:* **1. Sedimentary processes on the sea fl**
—*Author's summary.*

12M–311 551.465:551

Heezen, Bruce C. (*Lamont Geol. Obs., Palisades, N. Y.*), **Modern turbidity currents.** *In*
national Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers. Iss
Wash., D. C., AAAS, **1959.** p. 458–461. 2 figs. In English and French. **DWB** (551.46
I61pr)—Characteristic features of turbidity currents are briefly described. These currents
originate along any sediment covered steep slope. The supply of sediments to the slope
termines the quantity of the turbidity flow transported from a steep slope. Most of the turbi
flows originate at the mouth of major rivers and these are much more important in terms
material transported and in constructional physiographic features than the larger infrequent
bidity currents generated by earthquakes on the continental slope. A map is presented show
the occurrence of turbidity currents during the past 75 years. *Subject Headings:* **1. Turbi**
currents 2. Marine sediments.—*I.S.*

12M–312 551.462:551.352/3

Heezen, Bruce C. and Ericson, David B. (*both, Lamont Geol. Obs., Palisades, N. Y.*), **ysiographic and tectonic control in Atlantic deep-sea sedimentation.** *International Oceano- aphic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **59.** p. 461–463. fig. In English and Russian. **DWB** (551.46082 I61pr)—A brief descrip- n of the way in which topography influences the patterns of distribution of many parameters, d which is, in turn modified by the type and mode of sedimentation. Sedimentary deposits, sulting from turbidity currents and deep-sea currents plan an important part in controlling ysiographic and tectonic relief. It is likely that sediment deposits, such as are widely distributed the present sea floor, contributed largely to the geosynclinal filling of the former Atlantic arginal trenches and to the development of abyssal plains through the smoothing of the abyssal oor. A map of distribution of North Atlantic sediments is included. *Subject Headings:* **1. arine sediments 2. Sedimentary processes on the sea floor 3. Submarine topography.**—*I.S.*

12M–313 551.462:551.352/3

Hill, M. N., **Deep sea prospecting.** *Marine Observer,* London, 21(154):221–229, Oct. **1951.** figs. **DWB**—Describes an investigation of the bed of the N. Atlantic by "seismic refraction ooting" from a weather ship. A example of a sounding is shown, indicating a layer of sedi- ent 9150 ft thick, which probably represents a duration of some 2×10^9 years, roughly the age the earth. *Subject Headings:* **1. Marine sediments 2. Seismic refraction profiles 3. North tlantic Ocean.**—*C.E.P.B.*

12M–314 550.3:551.461.8:551.352/3

Hill, M. N., **The floor of the Atlantic Ocean.** *Nature,* London, 171(4359):857–860, May **, 1953.** 6 refs., table. **DWB**—Discussion at Royal Society Feb 26, 1953 included coring ethods, deep sea turbidity currents, elucidation of climatic changes from deep ocean sediment res, gravity measurements, deep structure, seismic refraction, crustal structure, and heat flow. *ubject Headings:* **1. Submarine geology 2. Submarine topography 3. Climatic changes Marine sediments.**—*C.E.P.B.*

12M–315 551.351/2:551.461.8

Kagami, Hideo (*Geol. Inst. Univ. Tokyo*), **Preliminary report on the shelf sediments off amo, Yamagata, Japan.** *Records of Oceanographic Works in Japan,* Tokyo, n.s. 5(1):60–67 **b. 1959.** 3 figs., 4 refs. **DWB**—The general character of grain size distribution and heavy ineral associations are noted and an explanation for the difficulty in finding submerged ancient orelines is given. Three zones are distinguished on the basis of size and mineral assemblage. edium sand at 70 to 90 m depth are thought to be ancient near shore sediment. *Subject Head- gs:* **1. Ancient shorelines 2. Marine sedimentary facies 3. Yamagata, Japan.**—*E.Z.S.*

12M–316 551.462:551.465:551.352

Kuenen, Philip H. (*Groningen*), **Turbidity currents a major factor in flysch deposition.** *clogae Geologicae Helveticae,* Basel, 51(3):1009–1021, Dec. **1959.** 2 figs., 11 refs. **DLC**—vidence for bathyal depths: Faunal: benthonic foraminifera, hieroglyphs, absence of neritic nthos in place. Inorganic: evidence from the present oceans, absence of shallow-water phe- omena. Formation thickness: wedge-shaped units up to 2000 m thick with depositional currents wards thin ends require depth of water approaching formation thickness. Bottom slopes: timates of bottom slopes together with distances of transport suggest more than 1000 m depth. vidence for turbidity currents and against sliding or creep: uniform transport for 200 km or ore, current features, contact between grains, grading, local slump structures, absence of creep present steep slopes, etc. Evidence for abnormally steep slopes: fluxo-turbidites, cobbles in nds, lamination in coarse sands. Evidence for sliding in some flysch units: psephitic mud- ones, boulder conglomerates. Supplement: In brackish Molasse: absence of reversing tidal rrents, if confirmed, excludes all mechanisms except turbidity currents. *Subject Headings:* **Turbidity currents 2. Flysch deposits 3. Marine sediments.**—*Author's abstract.*

12M–317 551.462:551.351

Kuno, Hisashi; Fisher, Robert L. and Nasu, Noriyuki, **Rock fragments and pebbles dredged ear Jimmu Seamount, northwestern Pacific.** *Deep-Sea Research,* London, 3(2):126–133, Feb. **56.** 5 figs., 2 tables, 4 refs. **DLC**—Fifty-five rock fragments and pebbles were dredged at 00–2800 fm (4650–5100 m) near Jimmu Seamount, 700 mi southeast of Kamchatka. Tuffaceous ale, andesitic and dacitic tuff, pyroxene-hornblende dacite-pumice, and augite-hypersthene andesite e the most abundant rock types. Minor constituents in the haul include augite-pigeonite basalt, gite-olivine basalt, olivine dolerite, quartz syenite porphyry, metabasalt, sandstone, and chert.

Petrographic and chemical analyses indicate closer affinities with Kurile Islands and Kamch volcanic rocks than with Cenozoic Japanese or Pacific Basin types. Probably these rocks w dropped by Pleistocene icebergs carried south and east by ocean currents. *Subject Headi* **1. Marine sediments 2. Northwestern Pacific.**—*Authors' abstract.*

12M–318 551.351.3:551.462/3:7

Laughton, A. S. (*Natl. Inst. Oceanog., Wormley, Eng.*), **Disturbance of the sediment face in the deep-sea as observed by underwater photography.** *International Oceanogra Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, 1 p. 466–468. table. In English and French. **DWB** (551.46082 I61pr)—A brief descriptio the forces which cause disturbance of the sediment surface in the deep sea after deposi Underwater photography and the study of cores show these forces to be of physical and logical origin. The principal physical forces are currents, and photographs have shown that are not confined to shallow water but exist even at depths of 1500 fm. In all cases currents been found on sea mounts. Disturbances due to abyssal benthic fauna are found mainly sediments with a high clay content. The distribution of disturbances in different physiogra regions is presented in tabular form. *Subject Headings:* **1. Sedimentary processes on sea f 2. Submarine photography.**—*I.S.*

12M–319 551.462:551.351.3(267.

Lisitsin, A. P. (*Inst. Oceanog., Acad. Sci., Moscow*), **Bottom sediments of the Antar** *International Oceanographic Congress, 1st, N. Y., 1959. Preprints of abstracts of pa* Issued Wash., D. C., AAAS, **1959.** p. 468–470. In English and Russian. **DWB**—An ana of about 400 samples of bottom sediments from the Indian and Pacific sectors of the Antar These samples were obtained by the Antarctic Expedition of the U.S.S.R. Academy of Scie during 1955, 1958, and included cores having a large diameter. The analysis shows that ments are supplied by the Antarctic continent. The chief features which determine sedimenta in the South-Polar zone are described. *Subject Headings:* **1. Marine sediments 2. So Antarctic expeditions 3. Antarctica.**—*I.S.*

12M–320 551.3.051:551.35:551.462(

Moore, David G. (*USN Elec. Lab., San Diego, Calif.*), **Stability of deep-sea sedimen slopes.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of pa* Issued Wash., D. C., AAAS, **1959.** p. 474–477. fig., table. German summary p. 476– **DWB** (551.46082 I61pr)—The study was designed to test the variation in strength of deep-sea sediments, with special reference to slope deposits, and to utilize these known stre characteristics for calculations of sedimentary slope stabilities, and to examine the pos frequency and effects of deep-sea slumps. For this purpose special cores were collected in North Pacific. For each sample, size distribution, wet density and porosity were determ The results are presented in tabular form. Taylor's theory for stability of infinite slop graphically illustrated. Results obtained suggest different origins for slope and flat abyssal deposits. *Subject Headings:* **1. Marine sediments 2. Deep sea slumps 3. North Pa Ocean.**—*I.S.*

12M–321 551.462:551.351.3(

Ostroumov, E. A. and Shilov, V. M., **Raspredelenie sernistogo zheleza i servodoro donnykh otlozheniiakh severo-zapadnoĭ chasti Tikhogo okeana.** [Distribution of f sulfide in the bottom sediment of the NW Pacific Ocean.] *Akademiia Nauk SSSR. In Okeanologii, Trudy,* No. 27:77–85, **1958.** 3 figs., tables, 9 refs. **DWB**—A description of in gation made relative to the study of reduction of sulfates in the bottom sediments of the Pacific as a result of certain microbiological processes. The material for the investigation furnished by the "Vitiaz," gathered during 1954 and 1955. A schematic chart of the Pacific showing location of stations at which samples of sediments were obtained, is sh together with vertical section of sample core, indicating the curves of sulfide distribution table, indicating the contents of sulfide and some other components in the samples, is inc A total of 10 station samples are considered Certain deductions are made on the basis o samples analyzed. *Subject Headings:* **1. Bottom sediments 2. Ferric sulfide in bottom ments 3. Northwest Pacific Ocean.**—*B.J.G.*

12M–322 550.342:551.242:551.

Oulianoff, Nicolas, **Répercussion des phénomènes géophysiques sur la sédiment marine.** [Repercussion of geophysical phenomena on marine sedimentation.] *Schweizer Naturforschende Gesellschaft, Geneva, Verhandlungen,* 138:109–111, **1958.** **DLC** (Q67.S The problems of the consolidation of sediments and of the pressure of sand beds at various d nd at very distant shores are discussed. The mechanical forces, earthquakes, tides and storms which affect the terrestrial globe constantly, and which give birth to microseismic vibrations, are nvestigated. The consolidation of sediments can not be considered as a process of a static nature, he earth's crust being in perpetual motion. A mixture of gravel, sand and clay subjected to ibration in a dry state shows a size settling. Experience with the same material, moistened at he bottom and covered by water, brings entirely inverse results when subjected to longitudinal ibration. Transverse vibration has the same effect on it as it had on dry sediments. The thickness/density of the sediments, however, causes peculiar effects. The simplified conditions in the aboratory can not be applied to the complicated factors of nature. The discovery of sand beds t the marine bottom, distant from the shores are explained by earth crust vibrations. *Subject Headings:* **1. Marine sediments 2. Sediment consolidation processes.**—*O.T.*

12M–323 550.9:546.791:551.462:553.551

Potratz, Herbert A. and Sackett, William M. (*both, Wash. Univ., St. Louis, Mo.*), **Ionium-uranium ratios in marine limestones.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 502–503. German summary p. 503. **DWB**—In drilling on Eniwetok Atoll recently deposited marine calcium carbonates as well as coral limestone cuttings and cores were taken at various depths. There were analyzed or uranium and Th^{230} to ascertain the conditions under which the Th^{230}—U^{328} ratio may serve as measure of geologic age. Results of this analysis are briefly discussed. *Subject Headings:* **1. Ionium/uranium ratios, age determination 2. Marine sediments 3. Eniwetok Atoll.**—*I.S.*

12M–324 551.462

Price, W. Armstrong, **Dynamic environments: reconnaissance mapping, geologic and geomorphic, of continental shelf of Gulf of Mexico.** *Gulf Coast Association of Geologic Societies, Transactions,* 4:75–107, Nov. **1954.** 16 figs., table, 12 refs. Reprinted as *Texas A. & M. College. Dept. of Oceanography and Meteorology, Contributions in Oceanography and Meteorology,* 2(31/59):59–91, **1954/1956. DWB**—A combination of oceanographic and dynamic geological approaches yields a new method of mapping a continental shelf. Mapping of the environments develops, and permits organization of, many basic geological data. The results form a starting point for detailed shelf surveys. Results of areal and regional surveys in the Gulf by the writer and those reported by others agree well with environments mapped. Many of he latter have been recognized on other coasts. Analysis of the shelf is based on the degree of development of the equilibrium bottom profile. Charactristic sectors of profile are based on lope. The slopes vary geographically. These variations are related to variations in energy of wave attack and correlate with the distribution of (a) geomorphic features, (b) sediment types and (c) erosional exposures of older strata. Marine forces are regrading submerged deltas on he shelf, but show little effect on drowned limestone karst bottoms. Submarine canyons head n the clay-floored shelf shoulder (camber). Canyons occur mostly on the broad, rapidly out-built, eltaic, medium energy, northern shelf and are absent on the slowly building, eastern limestone helves. Few, if any, occur on the moderately widened western deltaic shelf. *Subject Headings:* **1. Continental shelf studies 2. Submarine canyons 3. Gulf of Mexico.**—*Author's bstract.*

12M–325 551.462:551.351.3(266)

Rammohanroy Nayudu, Y. (*Dept. Oceanog., Univ. Wash., Seattle*), **Recent sediments of the Northeast Pacific.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of bstracts of papers.* Issued Wash., D. C. AAAS, **1959.** p. 477–479. fig. French summary p. 479. **DWB**—This paper is based on a study of 100 sediment cores obtained by the University of Washington. Northeast Pacific region may be divided into seven well-defined sedimentary ypes. The types are listed and described. The general character of sediment distribution based on the upper 10 cm depth of the cores is discussed and shown on a map. *Subject Headings:* **1. Marine sediment cores 2. Northeast Pacific.**—*I.S.*

12M–326 551.461.8:551.351.3:551.78(265.266)

Riedel, W. R. and Bramlette, W. N. (*both, Scripps Inst., La Jolla, Calif.*), **Tertiary sediments in the Pacific Ocean Basin.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 105–107. German summary p. 107. **DWB** (551.46082 I61pr)—From various areas of the deep Pacific Tertiary sediments were obtained and their ages determined. Age-assignments are based mainly on Foraminifera, Coccolithophorids and Radiolaria. It is pointed out that age determinations based on these three groups of microfossils investigated independently show a certain correlation. *Subject Headings:* **1. Marine sediments 2. Microfossils 3.Pacific Ocean.**—*I.S.*

12M–327 551.352(266):551.464(2

†Riley, J. P. and Sinhaseni, Prapas (*both, Univ. of Liverpool*), **Chemical composition**
three manganese nodules from the Pacific Ocean. *Journal of Marine Research*, New Hav
Conn., 17:466–482, **1958.** 5 tables, 52 refs. **DWB, DLC**—Three manganese nodules from
Pacific Ocean have been analyzed for 35 elements by using mainly spectrophotometric and sp
trographic methods. Cu, Co, Ni, Zn, and Pb were found in amounts approaching 1% wh
far exceeds their average concentrations in igneous rocks. On the other hand, elements s
as Ga, Sc, Zr, Y, La and Ti, are present only in amounts comparable with their concentrations
igneous rocks. Sb, Bi, Be, and Cr were not detected. The hydrochloric acid-insoluble fract
of nodules is practically free of the heavy metals that are characteristic of the acid-soluble fr
tion; it consists principally of clay minerals, together with lesser amounts of quartz, apat
biotite, and sodium and potassium felspars. *Subject Headings:* **1. Manganese nodules**
Minerals on the sea floor 3. Pacific Ocean.—*Authors' abstract.*

12M–328 550.9:546.841:551.462:551.3

Rona, Elizabeth; Akers, Lawrence K. and Parker, Patrick, **Age determination of deep-**
sediments. *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts*
papers. Issued Wash., D. C., AAAS, **1959.** p. 503–505. French summary p. 505. **DW**
The method utilized to determine the age of deep-sea sediments is described. The age of s
ments was determined by measuring the Th^{230}/Th^{232} ratio. Solvent extraction and ion excha
techniques were applied to separate the thorium from the cores. The counting system emplo
to calculate Th^{230}/Th^{232} ratio is described. A new counting system based on a design by F.
stein (1958) is also discussed. Results of analysis of cores from the Gulf of Mexico and N
Atlantic are presented in tabular form. *Subject Headings:* **1. Marine sediments 2. Sedim**
age determination 3. Gulf of Mexico 4. North Atlantic.—*I.S.*

12M–329 551.462:0

Royal Astronomical Society, **Turbidity currents: high-speed underwater flow of sedim**
suspensions (Nov. 28, 1958). *Geophysical Journal*, London, 2(3):248–250, Sept. 1959. **DW**
DLC—Report of a discussion held on Nov. 28, 1958. G. E. R. Deacon, the chairman, ope
the discussion by commenting on the prominence oceanography had acquired as a consequenc
its being recognized that turbidity currents may have been responsible for the breaking of
marine communication cables. In the formal portion of the discussion three speakers participa
The first speaker, A. S. Laughton of the National Institute of Oceanography, dwelt on t
classes of evidence of turbidity currents. He stressed the apparent importance of these curr
in producing features of lake and ocean floors, and called for more knowledge of their action
better understand their mechanics. R. Stoneley of Cambridge University, who spoke n
reviewed the problem from the hydrodynamical standpoint. He based his discussion on
aspects, in particular: (a) whether the turbidity current would spread longitudinally too gre
to be effective, (b) whether the motion of the current would persist over distances of the o
of 1000 km without being damped by viscous forces. T. H. Ellison of Manchester Unive
was the final speaker. He dealt with a mathematical consideration of the mixing of the turbu
flow with the clear water from above disturbing it and thickening the flow. A general discus
followed and brought the meeting to a conclusion. *Subject Headings:* **1. Turbidity curre**
I. Deacon, G. E. R. II. Laughton, A. S.—*I.S.*

12M–330 551.462:5

†Shepard, Francis P., **Marine sediments.** *Science*, Wash., D. C., 130(3368):141–149,
17, **1959.** 4 figs., 40 refs. Reprinted as *California. Univ. Scripps Institution of Oceanogra*
Contributions, 1959, issued **1960.** p. 311–319. **DWB** (551.46 C153co), **DLC**—The form
of sandstones and even conglomerates are not confined to shallow water, as was formerly beli
but these can form in deep water provided there are relatively steep slopes down which slides
turbidity currents may transport material to the deeps. Ripple marks and cross-bedding
been found in deep water sediments. Study of distribution grain size as a means of "fi
the shoreline" seems open to reexamination. Sand formations may be deposited on the conti
shelf contemporaneously with, and yet farther from shore than, mud formations and the two
have different geological sources. *Subject Headings:* **1. Marine sediments 2. Sediment tr**
port.—*Z.S.*

12M–331 551.462:551.351(

Starik, I. E.; Lisitsin, A. P. and Kuznetsov, Iu. V., **The rate of sedimentation in the so**
ern part of the Indian Ocean. *International Oceanographic Congress, 1st, N. Y., 1959,*
prints of abstracts of papers. Issued Wash., D. C., AAAS, **1959.** p. 488–490. In English

ussian. **DWB**—Detailed lithological investigations of long cores gathered by the Soviet Ant-ctic Expedition in 1955–1957 were carried out under laboratory conditions. The results give lues of sedimentation rates for different regions. It is pointed out that the sedimentation rate ith respect to the red deep-sea clay of the southern Indian Ocean amounts to 0.2 cm per 1000 ars, whereas the age of the lower layers of the core were approximately 1.25 million years old. *ıbject Headings:* **1. Marine sediment cores 2. Sedimentation rate 3. Soviet Antarctic ex-editions 4. Southern Indian Ocean.**—*I.S.*

12M–332 551.352:546.74:551.462

Turekian, Karl K. (*Dept. of Geol., Yale Univ., New Haven, Conn.*), **Rate of accumulation nickel in Atlantic equatorial deep-sea sediments and its bearing on possible extra-ter-strial sources.** *Nature,* London, 182(4651):1728–1729, Dec. 20, **1958.** 2 refs., table. **DWB, LC**—The rates of accumulation of nickel in a calcareous Atlantic equatorial core are given and mpared with Pettersson's estimated rate of accumulation of nickel on the Earth from extra-rrestrial sources. The three major climatic events recorded in the core indicate that the rates nickel accumulation for two zones are of about equal duration as that estimated by PETTERSSON. ıe author does not rule out the possibility of a significant nickel contribution to the deep-sea om terrestrial sources. The duration of each climatic zone recorded in the core, together with e description of each zone and the calculated rates of accumulation of nickel are presented in bular form. *Subject Headings:* **1. Nickel in marine sediments 2. Origin of nickel in marine diments.**—*I.S.*

12M–333 551.462:550.4:551.352/3

Walton, Alan and Broecker, Wallace S. (*both Lamont Geol. Obs., Palisades, N. Y.*), **A con-ibution to the geochemistry of ionium in deep sea cores.** *International Oceanographic Con-ess, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** 505–507. French summary p. 507. **DWB**—Core A-180-72 was studied as the possible model ionium deposition. The core was carefully selected from the equatorial regions of the Atlantic cean (lat. 00°35.5′N, long. 21°47′W) at a depth of 3750 m and had a total length of 470 cm. esults of numerous radiochemical measurements made on various physically and chemically parated fractions of the core material sampled at frequent depth intervals are tabulated and scussed. *Subject Headings:* **1. Ionium in marine sediments 2. Marine sediment cores Atlantic Ocean**—*I.S.*

EXTRATERRESTRIAL DEPOSITS

12M–334 523.51:551.352:551.462

Fredriksson, Kurt, **Cosmic spherules in deep-sea sediments.** *Nature,* London, 177(4497): –33, Jan. 7, **1956.** 3 figs., 8 refs. **DWB**—Account of magnetic spherules extracted from cores llected by the "Albatross" Swedish Deep Sea Expedition. Some are of Tertiary age. *Subject adings:* **1. Meteoric dust 2. Marine sediments.**—*C.E.P.B.*

12M–335 551.462:551.35

Laevastu, Taivo and Mellis, Otto, **Extraterrestrial material in deep-sea deposits.** *American ophysical Union, Transactions,* 36(3):385–389, June **1955.** 4 figs., table, 14 refs. **Discussion** ERNST J. ÖPIK, p. 389. **DWB**—Cosmic black spherules have been separated quantitatively om a long sediment core taken at a depth of 5000 m from the equatorial Pacific Ocean. Their e and mass distribution correspond with theoretical values obtained by ÖPIK (1951). Based this quantitative examination and PETTERSSON'S (1952) determination of the probable rate of dimentation in this area, it is estimated that about 125 tons of black cosmic spherules reach the arth per year. Chemical analyses in this core average 0.056 pct NiO and 6.21 pct Fe_2O_3 ETTERSSON and ROTSCHI, 1952). These values are too great to be accounted for by the nute quantities of spherules present. Instead, the Ni and Fe appear to be derived in part from precipitation from sea water. The time of geochemical circulation of Ni and Fe in sea water s been estimated at 2200 and 280 yr, respectively. *Subject Headings:* **1. Marine sediments Black spherules in the sea 3. Extraterrestrial deposits in the sea.**—*Authors' abstract.*

12M–336 523.51:551.353:551.462

Öpik, E. J., **Cosmic sources of deep-sea deposits.** *Nature,* London, 176(4489):926–927, ov. 12, **1955.** table, 8 refs. **DWB**—Argues that the black magnetic spherules found in deep-a deposits are micro-meteors, and the general nickel excess may be due to amorphous cosmic atter. *Subject Headings:* **1. Meteorites 2. Marine sediments 3. Black spherules on sea oor.**—*C.P.P.B.*

SUSPENDED MATTER

12M–337 551.463.8:546.3(26

†Armstrong, Francis A. J. (*Marine Biological Lab., Plymouth, Eng.*), **Inorganic** **pended matter in sea water.** *Journal of Marine Research*, New Haven, Conn., 17:23 **1958.** fig., 2 tables, 22 refs. **DWB, DLC**—The suspended matter in sea water has b separated with membrane filters (down to 0.1μ A.P.D.); the inorganic fraction, de mined by ignition, has been partly analyzed. The methods used are briefly descri An appreciable quantity of finely divided claylike material was found, and it is suggested that adsorption of organic matter from the water, this may support the bacterial flora. Samples ta regularly from the English Channel show a seasonal variation, the quantity found being grea in winter and ranging from 0.16 to 1.20 mg/1, the mean being 0.6 mg/1. The analyses sho approximately 43% SiO_2, 13% FeO_3, and 13% Al_2O_3. Silicon in suspension generally excee that in solution. At three deep water stations in the eastern Atlantic, smaller quantities suspended matter (0.05–1.00 mg/1) compared to the Channel were found. Some of the fig may be high owing to precipitation of calcium carbonate during storage. In the upper wa silicon in suspension exceeded that in solution, but below c. 100 m the reverse was the The amount of iron in suspension resembled that found by direct analysis. Some results aluminium in suspension show quantities around 37μgA1/1 in the English Channel and ar 12μg in the eastern Atlantic. *Subject Headings:* **1. Suspended matter in sea water 2. Eas Atlantic Ocean 3. English Channel.**—*Author's abstract.*

12M–338 551.463.8:54

Lisitsin, A. P. (*Inst. Oceanog., Acad. Sci., Moscow*), **Suspended matter in the ocean.** *ternational Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Is Wash., D. C., AAAS, **1959.** p. 470–473. In English and Russian. **DWB**—Work on suspe substances in the ocean done by scientists of the U.S.S.R. is briefly reviewed. About 1 samples have been obtained from sea and ocean water masses. These were collected a vertical sections down to considerable depths. The examination of suspended matter shows be derived from the land, from volcanoes, as the results of the chemical activity. Other stati information about the suspended matter in sea water is given. Results of several hundred gr lometric analyses and chemical analyses of suspended material from the Indian Ocean are discussed. *Subject Headings:* **1. Suspended matter in sea water 2. Marine geology 3. In Ocean**—*I.S.*

GEOPHYSICAL MEASUREMENTS

12M–339 550.341.6:662.2:539.1:551.462:551.1

Carder, Dean S. (*U. S. Coast and Geodetic Survey*), **Seismic waves from nuclear explo and the structure under the western Pacific.** *International Oceanographic Congress, 1st, N 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 13–14. In lish and German. **DWB** (551.46082 I61pr)—A brief description of how seismic waves nuclear explosions in the Eniwetok and Bikini Atolls have been utilized to deduce some o major substructures of the equatorial Pacific. Records were obtained at three temporary three IGY stations on neighboring atolls in the Marshall, Caroline, and Marianas groups a Rabaul in New Britain. Additional data were obtained from other oceanic points including porary stations in the Australian territories. *Subject Headings:* **1. Nuclear explosion dete 2. Seismological interpretations 3. Geologic structure of Western Pacific Ocean 4. We Pacific Ocean.**—*I.S.*

12M–340 551.462:530.3(267.5) 551.46.082:531.

Drake, Charles L.; Girdler, Ronald W. and Landisman, Mark (*all, Lamont Geol.* **Geophysical measurements in the Red Sea.** *International Oceanographic Congress, 1st, 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 21–22. F summary p. 22. **DWB** (551.46082. I61pr)—As part of the oceanographic program of the the research vessels "Vema" and "Atlantis" made geophysical measurements in the Red Sea. data consist of precision echo soundings made over 4000 mi of track, the total intensity Earth's magnetic field recorded for more than 2350 mi of the track and 15 seismic refr profiles. These data and gravity information are utilized to determine the geological str of the Red Sea. The geophysical results suggest that the Gulfs of Suez and Aqaba are grabens while the Red Sea is a more complex structure. *Subject Headings:* **1. Echo soun 2. Earth's magnetic field 3. Seismic refraction profiles 4. Gravity surveys 5. Red Sea**

12M–341 551.462

Ewing, John and Ewing, Maurice (*both, Lamont Geol. Obs.*), **Seismic refraction me ments in the Scotia Sea and South Sandwich Island Arc.** *International Oceanographic* *ess, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** 22–23. In English and Spanish. **DWB** (551.46082 I61pr)—Seventy-four seismic refraction ofiles were obtained during 1958 and 1959 by the research ship "Vema" and the oceanographic ip "Sanaviron" in the Drake Passage, Scotia Sea, Scotia Arc and South Sandwich Arc. These easurements suggest that the structure in the Drake Passage and western part of the Scotia a is the same as the average Pacific Ocean basin structure. Measurements on the Scotia Arc dicate that much of the region lying between 50° and 55° south latitude is considerably different structure from the Scotia Sea, and the Argentine Basin-south Sandwich Arc measurements ggest certain similarities to the structure of the West Indies Arc and the Puerto Rico Trench. *ıbject Headings:* **1. Seismic refraction profiles 2. Submarine topography 3. Island arcs Scotia Sea 5. Drake Passage 6. South Sandwich Islands.**—*I.S.*

12M–342 550.340.1:551.462

†*Hill, M. N., **Recent geophysical exploration of the ocean floor. Physics and Chemistry the Earth**, Vol. 2, pub. N. Y. Pergamon Press, **1957.** p. 129–163. 14 figs., 2 tables, bibliog. 161–163. **DWB** (551 P578), **DLC** (KC501.P53)—History of geophysical exploration of the ean floor, gravity measurements at sea, 1954–55, seismic soundings (refraction shooting methods d equipment, seismic reflection shooting and results), material and thickness of the several yers, heat flow, measurements at sea, ocean structure, surface wave dispersion, prospecting on lcanic islands and coral atolls and the structure of deep sea trenches, are discussed and data e presented in this article. *Subject Headings:* **1. Geophysical exploration of ocean floor Marine geology.**—*M.R.*

12M–343 551.462:551.14:551.24(261)

Koriakin, E. D., **O glubinnom stroenii zemnoĭ kory v oblasti Atlanticheskogo okeana.** The vertical structure of the earth crust in the region of the Atlantic Ocean.] *Akademiia Nauk SSR, Izvestiia, Ser. Geofiz.*, No. 12:1477-1484, Dec. **1958.** 8 figs., 11 refs. Transl. into Eng- h in the corresponding number of Its *Bulletin of the Academy of Sciences, USSR, Geophysics eries.* **DLC**—The author summarizes the method used and the results obtained by various udies on the geologic structure of the Atlantic Ocean bottom since the work of Vening-Meinesz the 20's. The author constructs a series of gravimetric profiles cutting the central Atlantic dge on the basis of data of Vening-Meinesz, and of Girdler and Harrison. Diagrams of the ofiles and map, showing the distribution of the gravimetric profiles and depths of the Mohorovicic rface in the Atlantic Ocean and epicenters of earthquakes in the Atlantic Ocean are presented. the Central Atlantic ridge the thickness of the earth's crust is 12–15 km. On both sides of e ridge are located the thinnest parts of the earth's crust with a thickness less than 10 km. he sections occupy large expanses in the ocean near which the continental thickness of the rth's crust increases to 30 km and more. Three types of earth's crust are observed in the tlantic Ocean, namely: (1) deep oceanic canyons, characterized by thin basalt layers and some dimentary deposits; (2) under water ridges; and (3) underwater continental shelf. *Subject eadings:* **1. Gravimetric profile 2. Earthquake epicenters in Atlantic 3. Submarine topog- phy 4. Atlantic Ocean.**—*I.L.D.*

12M–344 551.468:550.341(798)

Jordan, James N., **Crustal deformations in southeastern Alaska.** *International Oceano- aphic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **59.** p. 759–761. In English and German. **DWB** (551.46082 I61pr)—A brief description of severe earthquake which on July 10, 1958, shook the southeast coast of Alaska. The earth- ake originated near Lituya Bay and was associated with rupturing 150 miles along the Fair- eather Fault which follows the general trend of the coastline. This earthquake is one of many hich have occurred along or near the coast of Alaska or in the Aleutian Islands. The fault ane studies suggest a very similar earthquake mechanism for southeast Alaska as is found in alifornia. *Subject Headings:* **1. Earthquake July 10, 1958 2. Southeast coast of Alaska.**—*I.S.*

12M–345 551.462

†Laughton, A. S. (*Natl. Inst. of Oceanog., Wormley*), **The sea floor.** *Science Progress*, Lon- n; 47(186):230–249, April **1959.** Bibliog. p. 245–249. **DWB, DLC**—Recent progress in ophysical exploration of the ocean bottoms, especially the work done in the U. S., U. K and .S.S.R. since 1946, is reviewed systematically under the following headings: 1) bathymeter, topography, 3) abyssal plains, 4) deep sea channels, 5) trenches, 6) bathyscaphs, 7) under- ater photography, 8) sediments, 9) deep-sea rocks, 10) deep sea currents, 11) turbidity currents d 12) geophysical techniques for studying structure (seismic, geomagnetic, gravity measure- ents). Many specific papers reporting advances are cited. *Subject Headings:* **1. Ocean floor ploration 2. Deep-sea investigations 3. Geophysical techniques in oceanography.**—*M.R.*

12M–346 550.3:551.240:551

Ma, Ting Ying H. and Pan, Chia-Lin, **Whether the geological and geophysical phenom
of the circum-Pacific regions indicate an orogenic period is in progress.** *International Oce
graphic Congress, 1st, N. Y., 1959 Preprints of abstracts of papers.* Issued Wash., D.
AAAS, 1959. p. 807. **DWB** (551.46082. I61pr)—Tracing out the course of the sudden
displacement of the solid earth shell and the individual shift of crustal masses with the posit
of the segments of the fossil coralline seas of various ages, it is possible to conclude that oroger
is due to folding on the forward edges of moved crustal masses shaken up by the sudden
displacement of the solid earth shell. Interpreting orogenesis as due to this cause make
possible to coordinate other geological and geophysical phenomena with the occurrence of
genesis. The circum-Pacific Cenezoic orogenic belts show very clearly the inter-relations o
these phenomena. The root cause found for orogenesis makes it not a gradual but a su
process which must not be attributed to the accumulation of gradual effects on the earth
are working even now due to the earth's rotations. *Subject Headings:* **1. Circum-Pacific orog
belt 2. Origin of ocean basin.**—*Authors' abstract.*

12M–347 550.389:551.462(

Menard, Henry W. and Vacquier, Victor (*both, Scripps Inst. of Oceanog.*), **Magnetic
vey of part of the deep sea floor off the coast of California.** *California. Univ. Scripps
stitution of Oceanography, Contributions, 1958,* issued Nov. 1959. p. 464–469. 4 figs. D
(551.46 C15co 1958)—A report and graphical representations of a recent survey of a po
of the floor of the Pacific Ocean. The original observations were made with a magneton
towed behind the USC & GS ship "Pioneer." A map of the area surveyed, showing contour
of equal magnetic intensity is presented. The general ocean bottom topography of the are
discussed and shown in a map. The most conspicuous feature on this map is the escarpmen
the Murray fracture zone. The topographic and other structural details of the region are
cussed. *Subject Headings:* **1. Magnetic surveys 2. Submarine topography 3. Murray
ture zone 4. Pacific Ocean.**—*I.S.*

12M–348 551.21:551.24

Mooser, F. and Malonado-Koerdell, M. (*both, Mexico*), **Pene-contemporaneous tecto
of the Mexican land mass and the adjoining Pacific Basin.** *International Oceanographic
gress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS,
p. 41–42. Spanish summary p. 42. **DWB** (551.46082 I61pr)—Some tectonic factors goverr
structural conditions of the Mexican land mass and those of its adjoining ocean bed to the
This is evident from a study of Pleistocene volcanoes throughout Mexico and of recently
covered under sea volcanoes situated along major lines far into the Pacific Ocean. The di
tional effects associated with the Pacific Basin volcanoes are described. *Subject Heading*
Tectonics 2. Volcanic activity 3. Mexico 4. Pacific Ocean.—*I.S.*

12M–349 550.341.7:551.462:551.

Muraour, P. (*L'Institut des Hautes Etudes de Tunis*), **Études de séismicité artifi
sous-marine dans la baie et au large de la baie de Tunis.** [Studies of artificial subm
seismicity in and along the bay of Tunis.] (In: France. Centre National de la Recherche
entifique, **La topographie et la géologie des profondeurs océaniques.** Paris, 1959. p.
148. 3 figs., 6 refs. English summary p. 143.) **DLC** (GC83.F7)—Preliminary seismic
servations were undertaken in and off the Gulf of Tunis, These studies were based, first o
method by reflection, secondly on the method by refraction. In the present paper, descripti
given of the equipment, the techniques and the procedures which were used. Mention al
made of the first results which were obtained. For the sismic reflection investigations, the m
suggested by W. WEIBULL was first used. This method, which was rightly fitted to dee
survey showed to be unsatisfactory in the continental shelf area. Then a second method
tried: two or three shots were fired at the same station, each time the charge being con
but the distance charge-hydrophone, which both were put on the bottom, being increased, ho
without exceeding 150 meters. Seismic reflection as well as refraction experiences were rec
on a magnetic recorder. In laboratory the records obtained were filmed with passing th
frequencies filters. In the northwestern part of the Gulf of Tunis, two sedimentary layers
be identified. The first, with a thickness of about 750 m, consists in unconsolidated sedi
(1920 m/s) which are thought to belong to Oligo-Miocene. The second, constituted of
consolidated sediments (3050 m/s), may probably be referred to Middle Eocene. *Subject
ings:* **1. Submarine seismicity 2. Gulf of Tunis.**—*Author's abstract.*

12M–350 551.468:550.3

Nafe, John E.; Hennion, John F. and Peter, George, **Geophysical measurements i
Gulf of Aden.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abs*

papers. Issued Wash., D. C. AAAS, **1959.** p. 42–44. French summary p. 43–44. **DWB** 51.46082 I61pr)—During 1958 soundings, total magnetic field intensity measurements, and re reversed seismic refraction profiles were made along about 900 miles of track in the Gulf Aden. The existence of a rift valley extending east-northeast from the Gulf of Todjura is nfirmed by the soundings. The rift valley near the longitude of Aden becomes associated with marginal ridge system. Magnetic anomalies associated with the ridge and rift system and ismic refraction measurements are described. *Subject Headings:* **1. Geophysical measure-ents 2. Gulf of Aden.**—*I.S.*

12M–351 551.465.77 550.361:551.525:551.511

Nanda, J. N. (*Indian Navy*), **Certain speculations about the heat flow from below.** *In-rnational Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued ash., D. C., AAAS, **1959.** p. 44–45. German summary p. 45. **DWB** (551.46082 I61pr)—ne assumption that the heat flow over land might mainly be from the radioactive content of dimentary and granite rocks is contradicted by the observed equal heat flow from below the sea d on land. It is surmized that the major portion of the heat flow is due to heat flow coming om the interior of the earth. Boundaries of inner convection cells should account for slight fferences in heat flow between land and sea. *Subject Heading:* **1. Heat flow from earth's terior.**—*I.S.*

12M–352 551.462:551.21(261.264)

Neumann Van Padang, (*Den Haag, Netherlands*) and Richards, Adrian F. (*USN Hydro. ff.*), **Historic submarine volcanic activity in the Atlantic Ocean.** *International Oceanographic ongress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** 61–63. In English and French. **DWB** (551.46082 I61pr)—The authors examined reports of known submarine volcanic eruptions. Only 20 of these reports were found to represent true bmarine volcanic activity. The most recent eruption occurred in 1957 (Azores) and the oldest portedly in 1211 (Iceland). A generalized summation of reports with respect to the amount of ported activity in different areas is given. Various depths at which these eruptions occurred e also reported. *Subject Headings:* **1. Submarine volcanic activity 2. Atlantic Ocean.**—*I.S.*

12M–353 551.462:551.465(263)

†Officer, C. B.; Ewing, J. I.; Hennion, J. F. et al., **Geophysical investigations in the East-n Caribbean: summary of 1955 and 1956 cruises.** *Physics and Chemistry of the Earth,* Vol. pub. N. Y., Pergamon Press, **1959.** p. 17–109. 21 figs. (4 fold), table, 39 refs., 8 eqs. **DWB** 51 P578), **DLC** (GC501. P53)—The paper is concerned with an intensive examination of an and arc and deep sea trench and its associated interior basin. The work was conducted from search vessels. The instrumentation allowed simultaneous recording of information from ismic reflection and underwater sound transmission studies. The structure particularly in the epest part was found to be similar to oceanic structure, with the difference that the Venezuelan sin had a thicker crust. The research supported the previous hypothesis that the primary echanism in the formation of the eastern caribbean has been the introduction into the upper antle and crustal layers of differentiate of lighter material rising from deep within the mantle. *bject Headings:* **1. Geophysical investigations in Caribbean Sea 2. Deep sea trenches Island arcs 4. Eastern Caribbean Sea. I. Harkrider, D. G. II. Miller, D. E.**—*E.K.*

12M–354 550.382:(912)

Orlov, V. P., **Ob oshibkakh mirovykh kart napriazhennosti geomagnitnogo polia T v zhnoĭ chasti Indiiskogo okeane.** [Errors of world maps of the tension of the geomagnetic ld in the southern part of the Indian Ocean.] *Akademiia Nauk SSSR., Izvestiia, Ser. Geofiz.,* o. 12:1870–1872, Dec. **1959.** 2 figs., table, 2 refs. Transl. into English in the corresponding mber of its *Bulletin of the Academy of Sciences, USSR, Geophysics Series.* **DWB, DLC**— comparison of the absolute measurements of the three components of the electromagnetic field the ice in the Lützow-Holm Bay in Antarctica and of observations on the entire **T** force made means of a proton magnetometer carried out by Japanese investigations during 1957–1958 owed that the observations made during the first and second Japanese expedition are considerably aller than those on VESTINE's maps of 1945. The difference in **T** amounts to as much as 00 γ which is 10% of the normal value of **T** in the Lützow-Holm Bay regions. The 1957–58 observations deviate by 3.5° from the values of 1955 on British hydrographic maps. Maps owing the geomagnetic field near Lützow-Holm Bay and the distribution of **T** between South frica and Antarctica in 1958 and 1945 and tables giving values of **T** for different years and ints are presented. It is concluded that the existing data are no conclusive evidence for large lues of the secular variation of **T** that varies so strongly for comparatively small distances.

Earlier observations, when T was calculated from H and I may have had a low accuracy for There is no doubt that Vestine's maps for the region south of Africa are not accurate. T Japanese data are confirmed by observations made south of Africa in 1958 by the non-magne vessel the "Zarik." *Subject Headings:* **1. Geomagnetic field 2. Lützow-Holm Bay, A arctica 3. Indian Ocean.**—*I.L.D.*

12M–355 551.463.2

Phinney, Robert A. (*Calif. Inst. of Tech.*), **Leaking modes in the crustal waveguide, Pt. The oceanic PL wave.** *Journal of Geophysical Research,* Wash., D. C., 66(5):1445–1469, M **1961.** 25 figs., 2 tables, 7 refs., 38 eqs. **DLC**—The problem of the seismic signal associa with the earliest P wave is treated by application of normal mode theory, in which the signal regarded as a quasi-surface wave, coupled both to the motion of the earth's layered surface a to body waves propagating in the underlying media. Predictions made for the particular mo assumed are relevant to explosion and earthquake sources. The oscillations following the ini P motion are explained. The transient solution obtained by Rosenbaum for lacking mode pro gation in an acoustic waveguide has been generalized to describe propagation in an elastic ha space overlain by a liquid layer. The early-arriving PL modes known from earthquake stud have been computed for several theoretical models to test the effect of the elastic constants their dispersion and attenuation. Physical reasoning, based on harmonic plane wave mod appears inadequate for predicting many features of the exact dispersion and attenuation. analogy between PL waves and normal modes in the cast treated by Pekeris is exploited, and is also believed that PL waves are related to an attenuated pseudo-surface wave of a free s halfspace. Late arriving quasi-standing waves are treated briefly and their relevance to cert seismic phenomena is mentioned. *Subject Headings:* **1. Earthquake waves 2. PL waves** *Author's abstract.*

12M–356 551.231(2

Richards, Adrian F., **Volcanism in Eastern Pacific Ocean basin: 1945–1955.** *Internatio Geological Congress, 20th, Mexico City, 1956,* [*Proceedings*], 1:19–31, **1957.** 4 figs., table, refs. (in Section 1, Vulcanología del Cenozoico, "Primer tomo"). Reprinted as *Califor Univ. Scripps Institution of Oceanography, Contributions, 1959,* issued **1960.** p. 917–931. **D** (551.46 C153co)—During the last decade active volcanism, exclusive of fumarolic activity, the eastern Pacific basin appears to have been confined to the Islas Revillagigedo of Mexico the Islas Galapagos of Ecuador. In the Revillagigedo a new volcano, named Barcena, was b on Isla San Benedicto Aug. 1, 1952. A cinder cone 390 m high formed by Aug. 12, trach was extruded into the crater in Nov. and a delta of lava developed between Dec. and Feb. 1 Large crater solfataras became inactive in 1954. In the Galapagos volcanic activity was lim to Isla Isabela (Albermarle Island). Flank and/or crater eruptions occurred on Volcan W Volcan Alcedo, Sierra Negra and Cerro Azul between 1945 and 1955. Early in 1954 the sl of Bahia Urvina on the west flank of Volcan Alcedo was uplifted, apparently by the ascen magma which erupted in Nov. *Subject Headings:* **1. Oceanic volcanic activity 2. East Pacific Ocean.**—*Author's abstract.*

12M–357 551.462:550.34:5

Sysoev, N. N.; Mikhal'tsev, I. E.; Andreeva, I. B. et al. (*all, Inst. Oceanog., Acad. Moscow*), **The results of seismo-acoustic investigations of the ocean bottom.** *Internati Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D AAAS, 1959. p. 54–57. In English and Russian. **DWB** (551.46082 I61pr)—The applica of seismo-acoustic methods by the Institute of Oceanology of the Academy of Sciences of U.S.S.R. during its investigations in the Sea of Japan, the Black Sea, the Western Pacific, southern Indian and Pacific Oceans, and in Antarctic waters, has proved valuable. An esti of the differences in the thickness of the loose sediments covering the ocean bottom was n and information was obtained on the structure of the earth's crust. *Subject Heading:* **1. Seis acoustic investigations 2. Black Sea 3. Pacific Ocean 4. Antarctic Ocean. I. Lisi A. P. II. Neprochnov, Iu. P. III. Udintsev, G. B.**—*I.S.*

12M–358 551.462:526.7:5

Talwani, Manik; Worzel, J. Lamar; and Landisman, Mark (*Lamont Geol. Obs.*), **R gravity computations for two-dimension bodies with application to the Mendocino marine fracture zone.** *Journal of Geophysical Research,* Wash., D. C., 64(1):49–59, **1959.** 6 figs., 2 tables, 14 refs., 3 eqs. **DLC**—Expressions are derived for the vertical horizontal components of the gravitational attraction due to a two-dimensional body of arbi shape by approximating it to an n-sided polygon. These expressions are put in forms sui solution by a high-speed digital computer. As an example of the application of this method, e crustal section across the Mendocino fracture zone is deduced from the gravity anomalies. ssuming the crust to consist of a single homogeneous layer, overlain by water and sediment, is found to be about three km thicker to the north of the fracture zone than to the south of it. *bject Headings:* **1. Gravity surveys 2. Mendocino fracture zone.**—*Authors' abstract.*

12M–359 551.462(08)(425.9)

The geological and geophysical results of the cruises of R.R.S. Discovery II during ay–July 1958. *Geophysical Journal,* London, 2(2):168–170, June 1959. **DWB, DLC**—A port on a symposium on the geology and geophysics of the ocean floor held at the Dept. of eodesy and Geophysics and the National Institute of Oceanography at Cambridge, Eng. on March *Subject Headings:* **1. Ocean floors 2. Marine geology symposia 3. Geophysical sym-osia 4. Cambridge, Eng.**—*M.R.*

12M–360 91.04(99) 551.462 551.324(99)

Thiel, Edward; Ostenso, Ned A. and Bentley, Charles R., **Antarctic traverse reports.** *merican Geophysical Union, Transactions,* 40(3):277–282, Sept. 1959. 5 figs. **DWB**—Related aterials are presented. Seismic and gravity evidence seem to indicate the division of Marie yrd Land into two land areas separated by what would be, if the ice were removed, an area of pen water running from the Ross to the Bellingshausen Sea. No trough appears to exist between oss and Weddell Seas in the limited area measured to date. *Subject Headings:* **1. Seismic urveys 2. Gravity surveys 3. Marie Byrd Land, Antarctica.**—*E.Z.S.*

12M–361 551.463.7:551.465.534/5(263)

Wertheim, Gunther K. (*Woods Hole Oceanog. Inst., Mass.*), **Studies of the electric poten-al between Key West, Florida, and Havana, Cuba.** *American Geophysical Union, Trans-tions,* 35(6, Pt. 1):872–882, Dec. 1954. 9 figs., table, 10 refs., 9 eqs. **DWB**—The mass trans-ort of the Florida Current across the Key-West-Havana section has been studied by means of the ssociated electrical potential due to the geomagnetic field. An analysis of the seasonal, daily, and hort-term variations of the transport is presented, as well as a critical discussion of the limita-ons of the method of measurement employed. *Subject Headings:* **1. Electric potential 2. lorida Current.**—*Author's abstract.*

QUATERNARY HISTORY

12M–362 551.462:551.461.8

†Holtedahl, Hans (*Inst. de Géologie, Univ. of Bergen*), **Sur la géologie et la morphologie es plateaux continentaux glaciaires.** [Geology and the morphology of glacial continental helves.] (In: France. Centre National de la Recherche Scientifique, **La topographie et la éologie des profondeurs océaniques.** Paris, 1959. p. 245–263. 7 figs., 22 refs. English ummary p. 245.) **DLC** (GC83.F7)—The geomorphology of continental shelves off Norway, ortheastern and northwestern N. America, Ellesmere Island and W. Spitsbergen is discussed. is possible to distinguish between certain morphological features which are characteristic of laciated shelf areas: 1. Submarine fiords or depressions which are extensions of inland fiords nd straits. These have much the same width and depth as their inland continuations and may xtend to the shelf edge or at lesser distance from the coast. 2. Submarine channels terminating bays. The origin of submarine fiords and channels of categories 1 and 2 is probably very milar to that of their inland extensions, and is to a great extent due to glacial erosion. 3. Sub-arine marginal channels and slopes. Very extensive and relatively deep channels with a trend arallel to the major trend of the coast off Norway, Labrador-Newfoundland, southeastern Alaska nd northern Ellesmere Island are described. These channels, which normally separate the ner shelf from the outer bank area, are connected with linear slopes which are in line with e inner side of the channels, and which lead down to outer depressions in the shelf. 4. Trans-erse troughs and depressions off Norway, Labrador, southeastern Alaska and W. Spitsbergen re described. These form large-scaled depressions in the shelf floor. Common characteristics re their non-relationship to inland fiords, their termination landwards in a relatively steep slope orresponding to the marginal slopes, and their maximum depths very often at the foot of this ope. It is concluded that the marginal channels and slopes represent zones of dislocation of reat magnitude and that their present features, as well as the features of the great transverse epressions, cannot be explained purely by the erosive work of glaciers, but that they are to a reat extent tectonically determined. The fracturing is thought to be related to the late Cenozoic pwarping of the crust, which resulted in the present high elevation of the peripheral parts of the nd areas under consideration. *Subject Headings:* **1. Continental shelves 2. Glacial features**

of continental shelves 3. Tectonic effects on continental shelves 4. Norway 5. N America 6. Spitsbergen.—*Author's abstract.*

12M-363 551.461.8:551

†Głodek, Juliusz A., **Ostatnie badania oceanograficzne i ich rola w poznaniu czwartorz** [Latest oceanographic investigations and their role in the study of the Quarternary peri *Czasopismo Geograficzne,* Warsaw, Poland, 27(4):349–357, **1956.** 2 tables, 28 refs. **DL** According to the author the sampling of deep sea cores in various seas and oceans carried recently by scientists of many countries is the best method of learning about the stratigr of the Quarternary period. A review of recent achievements in this field convinces him this method will bring the best results. *Subject Headings:* **1. Quaternary period 2. Ma sediment cores.**—*A.M.P.*

12M-364 551.461.8:551.5

†Galon, Rajmund, **Zagadnienie ilości zlodowacén czwartorzędowych w świetle eustat nych oscylacji poziomu oceanow i wahań temperatury ich wód powierzcniowych.** [question of the number of Quarternary glaciations in the light of eustatic movements of o bottoms and temperature variations of their surface waters.] *Czasopismo Geograficzne,* War 25(3):228–248, **1954.** 6 figs., table, 20 refs. French summary p. 246–248. **DWB**—After ha reviewed and compared the deductions made by W. Szafer on the basis of his new synthesi the Polish Pleistocene with results of investigations made by E. Werth (1952), M. Pfannens (Levant, 1952), C. D. Dvey (Swedish expedition, 1950) and N. B. Tindale (Australia), author discusses the possibility of determining the number of glaciations on the basis of info tion from the oceans and particularly on the varieties of foraminifera species found in o bottom sediments, which would be closely linked with temperature variations of surface w and which could settle the long standing difference of opinions on this subject. The au concludes: investigations of the number of glacial periods and their relation to eustatic movem of oceans and to surface temperature variations did not yield up to now, any satisfactory answ regard to the number of glaciations. The correlation between the growth and decrease o masses on the earth surface and the temperature variations of ocan-levels has been establi but the rhythm of the processes, their phase and their link with individual glacial periods, eustatic and thermic variations of the oceans have been only partly determined. *Subject Headi* **1. Quaternary glaciation 2. Glacial periods 3. Ocean floors 4. Water surface tempera variations.**—*A.M.P.*

12M-365 551.466.7:525.6:55

Egedal, J. (*Kongevejen, 126, Birkerod, Denmark*), **On a pseudo-iterating method fo duction of observations of earth-tide for effects from tides of the seas, with an applic to observations made at Bergen (Norway) 1934.** *Journal of Atmospheric and Terre Physics,* N. Y., 16(3/4): 318–323, Nov. **1959.** 2 figs., table, 2 refs., 15 eqs. **DWB, DL** new method for the reduction of observations of earth-tide for effects from tides of the sea is for a special case. The method is applicable only when the variation of the effect from the of the sea is different from the variation of the earth-tide. In cases where the variation o effect from the tides of the sea is difficult to determine with certainty, or where the observa themselves are uncertain, the method may be inapplicable. *Subject Headings:* **1. Earth effects on sea tides 2. Bergen, Norway.**—*Author's abstract.*

COASTAL GEOMORPHOLOGY

See also: **Oceanography in India** (Nanda), 12M–40; **Amphibious warfare** (Farmer), 12M–93; **Problems in physical oceanography** (von Arx), 12M–891; **Upwelling of large horizontal extent** (Yoshida, Mao), 12M–895; **Coastal Upwelling** (Yoshida), 12M–896; **Coastal upwelling** (Yoshida, Tsuchiya), 12M–897; **East coast of India** (La Fond), 12M–901; **East coast of India** (Ramanadham, Varadachari), 12M–902; **Gulf of Panama** (Rodriguez), 12M–903; **Coast of Peru** (Schweigger), 12M–904; **Coast of Florida** (Taylor, Stewart), 12M–905; **Boundary phenomena** (Yoshida), 12M–907.

12M-366 551.465:532.59:551.46

†King, Cuchlaine, A. M. (*Univ. of Nottingham*), **Beaches and coasts.** London, E Arnold, **1959.** 403 p. numerous figs., bibliog. at end of each ch. Price: 65 sh. **DLC.** R in *Science Progress,* London, 48(191):586, July **1960.**—Recent investigations of coastal pro especially those associated with the character of the beach are included in this detailed stu

aches and coasts. Because waves are considered the most important forces acting upon the ore, they are discussed in considerable detail. Each of the chapters contains a summary and t of references. The twelve chapters of this comprehensive book are concerned with: 1) the ain factors on which the character of the beach depends; 2) methods of research; 3) waves; movement of material on the beach; 5) beach profiles; 6) the effect of wind; 7) classification beaches and coasts; 8) constructive wave action and coastal accretion; 9) destructive wave tion and coastal erosion; 10) beach gradient and beach profiles; 11) historical data on coastal ange; 12) coastal types and their development—the marine cycle. Tables, charts and illustrans taken from various parts of the world supplement the text. *Subject Headings:* **1. Coastal eomorphology books 2. Beach profiles 3. Shore processes 4. Classification of beaches Coastal classification.**—*E.Z.S.*

12M–367 551.468:551.46:016

†Griesseier, Helmut, **Zur Organisation und Thematik der Küstenforschung in der Sowtunion.** [Organization and program of coastal investigations in the U.S.S.R.] *Acta Hydroysica,* Berlin, 5(1):5–38, **1958.** 220 refs. German summary p. 5. **DLC**—This survey is sed on the author's 3-month study tour of Russia and gives a general view of the state of oceaography which the author found was largely influenced by D. W. Johnson's book **Shore proc-sses and shore line development** (New York, 1919). The U.S.S.R.'s institutional organizaon, coordination of programs and problems, methods and research work within oceanography cluding a bibliography of well over 200 Russian works are reviewed here. This over-all survey itself giving a bird's-eye view of the present scientific activity as related to oceanography, will followed by more detailed discussions on several aspects and subjects to be published. *Subject eadings:* **1. Oceanography institutions 2. Coastal investigations 3. Coastal geomorpholgy 4. Oceanography bibliographies 5. U.S.S.R.**—*W.N.*

COASTAL DYNAMICS

See also: **Amphibious warfare** (Farmer), 12M–93.

12M–368 551.509.329:551.556.8:551.466.3:551.468(263)

†Bretschneider, Charles L., **Wave forecasting relationships for the Gulf of Mexico.** *U. S. each Erosion Board, Technical Memorandum* No. 84, Dec. **1956.** 27 p. 16 figs., table, 21 refs., eqs. **DWB.** Also in: *Texas. Agricultural and Mechanical College. Dept. of Oceanography d Meteorology, Contributions in Oceanography and Meteorology,* 3(60–89):333–367, 1955–1957. sued **1958. DWB**—The report describes the development and applications of a method for mputing wind wave data over the Continental Shelf of the Gulf of Mexico. Several genalized forecasting curves, as well as the mathematical derivations of the formula used, have en presented. *Subject Headings:* **1. Wind wave calculations 2. Wind wave forecasting Gulf of Mexico.**—*N.N.*

12M–369 551.46.085:551.465:551.468.6

*†California. State Water Pollution Control Board, **Investigation of current measurement estuarine and coastal waters.** Its *Publication,* No. 19, **1959.** 233 p. 109 figs., bibliog. p. 1–228, eqs. **DWB**—A systematic study of the various aspects of current measurements in astal and estuarine waters. The various types of currents that occur in such waters are classid. The report also includes a classification of current detection methods, a discussion in detail the instruments which have been developed, the methods and cost of data reduction, and conusions and recommendations. Numerous graphical representations and diagrams illustrate the udy. *Subject Headings:* **1. Current measurements in estuaries 2. Current measurements coastal waters 3. Current measurement instruments 4. Estuarine currents.**—*I.S.*

12M–370 551.468.2:532.7

Caloi, P. and Spadea, M. C., **Le oscillazioni libere del golfo di Civitavecchia e l'azione ella viscosita cinematica.** [Free oscillations in the Gulf of Civitavecchia and the effect of netic viscosity.] *Annali di Geofisica,* Rome, 12(2):161–177, April/May **1959.** 2 figs., table, refs., 39 eqs. Italian and English summaries p. 176–177. **DLC**—The aim of the present work the study of free oscillations in the Port of Civitavecchia. The application of ordinary thermonamic theories has yielded, however, values smaller than those observed. Thus, in this particular se, water can not be considered an ideal fluid. In view of the modest depth of the port (about ½ ft) and its relative considerable extent, it must be supposed that viscosity influenced the crease of the period. After having considered this aspect of the problem, a theory concerning e effect of kinematic viscosity was applied yielding excellent results. A theoretical value (*T* 10^m, 8) coinciding with the average observed was obtained for the uninodal of the gulf. The lengthening of the period which would take place in the case of an ideal fluid has turned corresponding to the action of dynamic viscosity for which we obtained $v = 840$ c.g.s. *Subj Headings:* **1. Free oscillation in gulfs 2. Kinematic viscosity 3. Italian coast.**—*Autho abstract.*

12M–371 551.468.2:551.466.

Cherkasov, V. S., **Raschet rezonansnykh kolebanii vody v zalive.** [Calculation of resona oscillations of water in a bay.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 11:1636–16 Nov. **1959.** 3 figs., 4 refs., 20 eqs. Russian summary p. 1636. **DLC**—Forced oscillations water by action of sea waves entering the narrow entrance of a gulf, bay or harbor were inve gated by the author with consideration of N. N. Moiseev's method of evaluation of the resona characteristics. The problem of oscillation of water under definite conditions is mathematic formulated with a set of differential equations of harmonic motion. Solution of these equation described and an account of frequency of incoming waves, depth of harbor, parameters conne with the amplitude, length and phase of the sea wave, approaching the entrance is given. amplitude of the resonance is expressed with a trigonometric function and its variations discussed in the text and illustrated with graphs. *Subject Heading:* **1. Resonance oscillati in coastal reentrants.**—*N.P.S.*

12M–372 551.468:551.46

Delaney, Patrick J. V. (*Univ. of Rio Grande do Sul, Brazil*), **Reconnaissance of the coa sector of Rio Grande do Sul, Brazil.** *International Oceanographic Congress, 1st, N. Y., 19 Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 684. In English German. **DWB** (551.46082 I61pr)—During the last two years investigations of the coa sector of Rio Grande do Sul, Brazil, have been made. Biologic, aquatic and sedimentol samples have been collected, analyzed and tabulated. The results of these studies are inclu Observations have been made on the Falkland and Brazil Ocean Currents, which operate al the coast of Rio Grande do Sul. In winter the Falkland Current is the stronger and during summer months the Brazil Current is the stronger. These currents play an important role in distribution of marine organisms as well as in the modification of shoreline features. The gen of peculiar heart-shaped (cordiform) coastal lages is also discussed. *Subject Headings:* **Ocean currents 2. Falkland current 3. Brazil current 4. Shoreline features 5. Rio Gra do Sul, Brazil.**—*Author's abstract.*

12M–373 532.5:551.468.1:551.46

Dmitriev, A. A. and Bonchkovskaia, T. V., **Avtokolebatel'noe dvizhenie vyzyvaemoe neniem u otkosov.** [Auto oscillatory motion produced by waves on slopes.] *Akademiia N SSSR, Doklady*, 84(2):265–268, **1952.** 2 figs. **DLC**—A description of a laboratory proce for measuring the erosion of natural slopes by natural wave action. The break down in slopes per second with various types of waves for slopes of different angles with the botto calculated and represented graphically. The mechanism of erosion appears to be a conseque of an auto-oscillatory movement of fluid. A physical explanation is presented. *Subject H ings:* **1. Experimental hydrodynamics 2. Wave action 3. Beach erosion.**—*I.L.D.*

12M–374 551.466.446:532:593:554.4

Ertel, Hans (*Acad. de las Ciencias de Berlin y Catedratico de la Humboldt-Univers Berlin*), **Sobre el campo de olas en la zona litoral.** [Wave field in a coastal zone.] *Beit sur Geophysik*, Leipzig, 68(2):123–128, **1959.** 2 refs., 24 eqs. Spanish and German summa p. 123. **DWB, DLC**—The impact of sea waves on a steep coast destroys the wave and sets reflective wave motion. Using a theoretical model the subject is treated in some detail. Solut using hydrodynamic equations yield a qualitative representation of the aspects of the wave f *Subject Heading:* **1. Wave reflection on steep coasts.**—*W.N.*

12M–375 551.466

Gade, Herman G. (*Oceanografisk Inst., Univ. Oslo*), **Effects of a nonrigid, imperme bottom on plane surface waves in shallow water.** *Journal of Marine Research*, New H Conn., 16(2):61–82, **1958.** 12 figs., 5 refs., numerous eqs. **DWB, DLC**—Mutual effect progressive wave motion in shallow water and in underlaying fluid sediments are discussed, emphasis on modification of the surface wave. The mathematical model is a layer of inv fluid overlaying a viscous fluid of greater density and bounded by a horizontal rigid plane. S tions for locally periodic, simple harmonic disturbances indicate that wave height decays ponentially with travelled distance. It is found that the rate of decay has a maximum value the dimensionless parameter $h_0\sqrt{\sigma/2v}$ has a value of 1.2, σ being the angular frequency, scosity, and h_0 the thickness of the lower layer. The rate of dissipation of energy in the lower ver is found to be proportional to (a) the wave energy, (b) the ratio of amplitudes at the erface and the surface, and (c) the sine of an angle closely related to the phase difference tween profiles at the free surface and the interface. Comparison is made between typical values water decay due to dissipation in a fluid bottom and that due to friction loss over a rigid sand ttom. Even in a relatively thin layer of mud the dissipation exceeds by far the energy loss due bottom friction. *Subject Headings:* **1. Shallow water waves 2. Waves in shallow water.** *Author's abstract.*

12M–376 551.446.441

Gade, Herman G. (*Oceanog. Inst., Univ. Oslo*), **Energy dissipation from surface waves ie to induced motion in soft bottom deposit.** *International Oceanographic Congress, 1st, . Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 752–753. English and German. **DWB** (551.46082 I61pr)—The mutual effects of progressive wave otion of small amplitude in shallow water and in underlying soft sediments are discussed with nphasis on modification of the surface waves due to energy dissipation in the sediments. Two athematical models are used, corresponding to observed cases on the continental shelf of the ulf of Mexico: 1. The sediment behaves like a heavy, viscous fluid of finite depth, over a rigid oor. 2. The sediment is of infinite depth, is opposing induced motion by elastic forces, while the same time energy is dissipated through the action of viscosity. In both cases the wave ecay due to these effects is significant. It is shown that the energy transport from water to diment is proportional to (a) the wave energy, (b) the ratio of the amplitude at the interface nd the surface, and (c) the sine of the phase difference between the profiles of the free surface nd the interface. In the first case it is found that the corresponding wave decay may assume straordinarily high values, as may be observed over soft spots on the Texas and Louisiana Gulf oast. In the second case the possible influence of elasticity to the wave motion is discussed. It found that the wave decay decreases rapidly with an increasing coefficient of elasticity, and that the region of the observed coefficient of elasticity this effect may be important. Also the effect various coefficients of viscosity is discussed. *Subject Headings:* **1. Wave action in shallow ater 2. Gulf of Mexico.**—*Author's abstract.*

12M–377 551.468:525.6:551.48

Glover, R. E. (*U. S. Geological Survey, Denver, Colo.*),**The pattern of fresh-water flow a coastal aquifer.** *Journal of Geophysical Research, Wash., D. C.,* 64(4):457–459, April **1959.** g., 5 refs., 6 eqs. **DLC**—Formulas are developed for the flow pattern followed by the seaward- oving fresh ground water as it nears a beach. It is found that, under steady flow conditions, a arply defined interface is formed between the fresh and salt water. Along the interface the essure of the static salt water, owing to its greater density, is counterbalanced by the pressures hich drive the fresh water seaward. The fresh water escapes through a gap between this inter- ace and the shore line. An increase in the flow of fresh water widens the gap. Tidal action auses a diffusion of salt water across the interface. This salt is carried back to sea with the esh-water flow. *Subject Headings:* **1. Coastal aquifers 2. Fresh and salt water interface Tidal intrusions.**—*Author's abstract.*

12M–378 551.466.441

Glukhovskiĭ, B. Kh. and Vilenskiĭ, Ia. G., **Veroiatnostnye kharakteristiki volnovogo dav- eniia na svaiu.** [Probability functions of wave pressure on piles.] *Moscow. Gosudartstvennyĭ keanograficheskiĭ Institut, Trudy,* No. 36:87–127, **1957.** 26 figs., 10 tables, 6 refs., 8 eqs. **WB**—The effect of wave pressure upon piles under natural conditions was investigated at a ecially established and equipped experimental station at Neftyanye Kamni. The experimental ation, including the layout, the apparatus and type of observations, are described with the aid a diagram showing the position of the dynamometers and wave meters, photographs and graphs. he contents of this study include the following: relationship between the mean height of waves nd their mean pressure upon the dynamometer cabinet with a diameter of 480 mm; function of istribution of pressure of sea waves upon the dynamometer console with a 480 mm diameter; two imensional distribution function of heights and pressure of waves; pressure of waves upon the ynamometer cabinet with a diameter of 380 mm; determination of the pressure of waves upon pile as determined from the theory of unique waves; the dependence of the pressure of waves pon a pile as a function of depth of sea; and a method for determining the force of wave pres- ire upon a single pile. Appropriate formulae and extensive numerical data in tables and graphs e presented. *Subject Headings:* **1. Wave pressure effects on piles 2. Wave pressure meas- ring equipment 3. Neftyanye Kamni Station.**—*I.L.D.*

12M–379 551.466.441:551

Gohin, Francois (*Ingénieur à la Soc. Grenobloise d'Etudes et d'Applications Hydrauliqu* **Etude empirique des spectres de houle en un point donné au voisinage des côtes.** [Empi study of wave spectra at a given point in the vicinity of the coast.] *France. Comité Cen d'Océanographie et d'Etudes des Côtes, Cahiers Océanographiques,* 12(2):83–110, Feb. 1 9 figs., 4 refs., numerous eqs. French summary p. 83. **DLC, DWB**—An empirical treatn of wave spectra. Fourier's harmonic analysis of waves and Tukey's statistical methods appraised. Pierson and Newmann's classic methods apply only to waves in the open ocean to those near the coast. The spectra of waves near the coast are analyzed and the number variables involved is pointed out. *Subject Headings:* **1. Wave spectra 2. Nearshore w spectra.**—*E.Z.S.*

12M–380 551.466.446(21

Johnston, A. K. (*Newcastle Univ. Coll., Tighe's Hill, Australia*), **Recherches sur les br lames flottants destinés à réfléchir la houle en eau peu profonde.** [Observations on floa breakwaters for reflection of shallow water waves.] *La Houille Blanche,* Grenoble, 13(5):5 550, Oct. **1958.** 4 figs., 17 eqs., 4 refs. and 13(6):619–638, Nov. **1958.** 15 figs. (inclu photos), tables. French and English texts. French and English summaries. **DLC**—The pre study arose from a problem of beach erosion. Since steep waves erode a beach and low can waves build it up, the possibility of partial reflection of oncoming waves by floating barriers considered as a means of protection. The objective was to reflect sufficient energy so that w reaching the shore would be constructive rather than erosive. This problem has been investig theoretically and experimentally, starting with the premise that to be effective a floating bar should reflect approximately 50% of the energy of waves of all periods up to 10 seconds. F ing barriers cannot be rigidly restrained and their earlier use has depended simply on their in for reflective effect. Practical considerations of barrier size limit inertia reflection to wave less than about 6 seconds period. To deal with the longer waves the phenomenon of reson has here been employed by making the floating barrier an openended water container of dimensions that the enclosed water tends to reflect the longer waves by its internal resona Two successful designs of floating breakwater using this combination of inertia and reson have been developed and tested on a model scale of 1 to 120. Their performance is show be an advance on anything hitherto achieved and their possible wider application for purp besides beach protection are indicated *Subject Headings:* **1. Shallow water wave reflection Beach erosion 3. Floating breakwaters.**—*Author's abstract.*

12M–381 551.553.8:551.465:551.468(28

Koshechkin, B. I., **Shtormy i dinamika beregovykh form.** [Storms and the dynamic coastal forms.] *Priroda, Moscow,* No. 11:92–93, Nov. **1958.** 3 figs. **DLC**—During storm the Caspian Sea the water along the coast attains heights of 0.5–1 m; at the same time a w current opposite to the wind direction arises and it reaches a velocity of 5–6 km/hr; such su variations are capable of producing changes in the morphological profile of the coast. In Caspian Sea the islands Kulaly, Severnyĭ Morskoe and Iuzhnyĭ Morskoe forming a ring in central part of Mangyshlak Bay constitute a partly closed ring connecting with the sea thr one wide (northern) and two narrow straits; one between the southern ends of Kulaly Iuzhnyĭ Morskoe and the others between Iuznyĭ Morskoe and Severnyĭ Morskoe. During tense northerly winds a difference in level is established between the waters bounded by the is and the sea. Earlier formed channels which cut across the islands no longer function. One o channels forms a washed out cone of sand detritus. The formation of this channel is assoc with the intense storm of 1952. After the letting of excess waters through the channel comp tory currents and waters entered within the archipelago which facilitated the development o channel. *Subject Headings:* **1. Coastal configuration effects 2. Storm effects on co reentrants 3. Caspian Sea.**—*I.L.D.*

12M–382 551.542.1:551.552:551.465:55

Labeĭsh, V. G., **O vliianii sily Koriolisa na pribrezhnye techeniia v suzhivaiushchi i rasshiriaiushchikhsa kanalakh.** [Effect of of the Coriolis force on coastal currents in tracting and expainding channels.] *Akademiia Nauk SSSR, Ser. Geofiz.,* No. 11:1714–1716, **1959.** fig., 5 refs., 5 eqs. Transl. into English in the corresponding number of its *Bullet the Academy of Sciences, USSR, Geophysics Series.* **DLC**—Coastal currents are consider movements of the fluid in a turbulent boundary layer. The movements around large islan mainlands are mathematically formulated with consideration of earth's rotating forces. criterion for flow along shores of contracting and expanding channels is introduced in the fo non-dimensional parameter (K), characterizing the Coriolis forces. The solution of deve differential equation is described with details and graphic illustration. The final equation c lied for solution of the problems on propagation of ocean currents around the mainland and nds. The currents are affected by the Coriolis forces differently. In the Northern Hemisphere current is pressed to the right shore and moves out from the left shore. In the Southern nisphere the current is pressed to the left shore and a quiet zone is formed on the right shore. ject Headings: 1. **Coastal currents 2. Coriolis effects on coastal currents.**—*N.P.S.*

12M–383 525.3:551.465
Labeĭsh, V. G. (*Leningrad, Hydromet. Inst.*), **On the influence of the Earth's rotation on nearshore circulation.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints ıbstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 695–699. fig., 3 eqs. In English Russian. **DWB** (551.46082 I61pr)—To show the influence of the Earth's rotation on the rshore circulation a series of equations is presented. The solutions of the equations show the effect of the Coriolis force on nearshore currents causes some specific peculiarities nown for small scale flows. These peculiarities for the Northern and the Southern Hemieres are described. The asymmetry of the flows increases with latitude and the scale of the and decreases with the acceleration of the velocity of the stream. It is stronger in diverging nnels than in converging ones. *Subject Headings:* **1. Nearshore circulation 2. Earth's ation 3. Coriolis effect.**—*I.S.*

12M–384 551.465(262)
Lacombe, Henri and Lizeray, J. C., **Contribution to the study of Gibraltar Strait.** *Interional Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued sh., D. C., AAAS, **1959.** p. 699–702. 3 figs. French summary p. 701–702. **DWB**—tematic measurements of surface and subsurface currents carried out in Aug. 1958 during IGY cruise on board the "Winaetta Singer," the new research ship of the Institut Océanophique de Paris are briefly reported. The in and out of lows computed on the basis of the asured velocities are presented in tabular form. A graph showing the net velocity obtained wo stations is also given. *Subject Headings:* **1. Current measurements 2. Gibraltar Strait.** *.S.*

12M–385 532.593:551.465(267)
La Fond, E. C. and Borreswara Rao, C., **Rotary currents in Bay of Bengal.** *Andhra Univ., ltair, India, Memoirs in Oceanography,* 1:102–108, **1954.** 7 figs., 2 refs. **DLC** (GC1.A55)—ıg bands of alternately smooth and rough surface water were observed in many places along coast of eastern and northeastern India. By repeated bathythermograph observations and by ing the surface current it is concluded that these are "rotary currents." Their flow is in the n of interlocking spirals with their axes in the direction of the prevailing current. This ates lines of convergence where the interlocking surface flows are towards each other and s of divergence where the flows are away from each other. The vertical thermal structure ws deeper isotherms under lines of convergence and shallower isotherms under lines of diverce. The vertical thermal gradients have developed more layer depths and stronger gradients areas of convergence than in areas of divergence. Rotary currents are believed to be deoped in the turbulent regions where off-shore tidal currents come in contact with the prevailing stal currents. *Subject Headings:* **1. Rotary currents 2. Band-wave movement 3. Bay of ngal, India.**—*Authors' abstract.*

12M–386 551.468:551.46.082
Longinov, V. V., **Dvizhenie vody i nanosov v pribrezhnoĭ zone moria.** [Movement of er and sediments along sea shores.] *Priroda,* Moscow, 47(2):90–92, Feb. **1958.** 3 figs., 2 -refs. **DLC**—Under the action of waves and associated currents sediments are set in motion ıg the seashore and perpendicular to it, both towards the shore and the sea. To measure the cessive changes in speed and direction of the motion of bottom waters the so-called "DVK" aratus was developed. The device is a tensiometer measuring water pressure. Its sensing nent is a thin disc fastened to an aluminum stem which screws into a flexible rod. The aratus is placed several cm above the bottom perpendicular to approaching waves. Under the e pressure the electrical resistance of the tensiometer alters and it is recorded on an oscilloph tape. The use of the device, the method of interpreting the pressure from the record and its to analyze the amount of movement of shore sediments are described with the aid of a diagram a graph. A diagram of the instrument is presented. *Subject Heading:* **1. Shallow water es 2. DVK tensiometer 3. Sediment transport**—*I.L.D.*

12M–387 551.468.1 532.59:551.465
†Longinov, V. V., **O dinamike priboinoi zony i beregovoi zony u tselom.** [Dynamics of surf zone and of the shore zone as a whole.] *Lietuvos TSR Mokslų Adademija. Geologijos*

ir Geografijos Institutas, Moksliniai Pranešimai, Vol. 7. Geologija. Geografija, p. 131–181,
Lithuanian and English summaries p. 174–179. 7 figs., 42 refs., 8 eqs.—Characteristi
the surf zone are discussed in terms of energy transformation and dissipation. Next the f
approach of waves is discussed in relation to water and sand dynamics and then consider
the light of a diagonal wave approach with an optimum angle of 60°. The study of surf
relief includes hypotheses on formation of beach cusps, accumulation areas and bayous. T
followed by shore dynamics in general and flat shore dynamics in particular. "Line of the
contour" is suggested as a more correct term than "profile." Some working hypotheses for
tional studies are suggested. *Subject Headings:* **1. Shore zone dynamics 2. Beach cusp fo
tion 3. Bayous 4. Surf zone dynamics.**—*W.N.*

12M–388 551.468:551.556.8:551.461.2(2

Lundbak, A. (*Danish Met. Inst.*), **Surge frequencies along the Danish west coast.** *De
Hydrographische Zeitschrift,* Hamburg, 10(5):176–183, 1957. 6 figs., table, 10 refs., 4
English, German and French summaries p. 176. **DWB**—Extreme values of meteorologica
ments can be treated statistically by various methods. Such methods correspond to dif
frequency formulas; four of these are considered in the following, dealing with the frequ
of high sea-levels. Each formula has its special feature and its limitation. A limit is al
by the available number of observed values. As to the southern part of the Danish west
flood-levels with heights about four over mean sea-level have occurred in this century; flood
with heights of 5 m or even more over mean sea-level must be foreseen, and specified frequ
can be assigned to them. Along the central, directly west facing part of the Danish coa
flood-levels are lower; here values of about 3 m have occurred in this century. Further
north, along the Skagerrak coast, flood-levels are roughly half as high. As the highest occ
flood-levels are dependent on the strongest occurring gales, the frequencies of these are s
considered. *Subject Headings:* **1. Surge frequencies 2. Flood levels on coasts 3.
coast of Denmark.**

12M–389 532.59:551.46:525.6 551.466.3:551

*Nakano, Masito and Unoki, Sanae (*both, Met. Res. Inst., Tokyo*), **Ocean waves an
secondary undulations of tides on the southern coast of Kii Peninsula.** *Records of C
graphic Works in Japan,* Tokyo, Special Number, No. 2:57–67, March 1958. 4 figs., 15
3 refs., eqs. **DWB**—Among the various kinds of water waves which affect coastal engin
and other maritime industries, the tides have been rather fully investigated, but the actua
of wind waves and swell has not yet been made clear owing to difficulties in observation.
cerning the secondary undulations of tides many excellent papers have been published sin
appearance of the famous paper of K. HONDA, T. TERADA and others, but these papers
most part concern the period of undulation, and there are only a few that consider the am
or energy of oscillation which is directly related to the destructive power of the waves
present report gives some statistics on wind waves, swell and secondary undulations of ti
the southern coast of Kii Peninsula, based on observations made over a long period o
Subject Headings: **1. Wind waves 2. Swell 3. Tidal effects 4. Kii Peninsula, Ja**
Authors' abstract.

12M–390 551.468.2:551.465.5

Nakano, M. and Abe, T. (*both, Met. Res. Inst., Tokyo*), **Standing oscillation of bay
induced by currents.** *Geophysical Magazine,* Tokyo, 28(3, Pt. 1):375–397, March 19
figs., 2 tables, 6 refs., 12 eqs. **DLC**—A model experiment was carried out on the s
oscillation of water in a bay induced by tidal or oceanic currents rushing past the bay l
A discussion was made on the mechanism of excitation of this standing oscillation based
theory of Kàrmàn vortices. It was shown that a relation $l/u = T$ exists among the p
of the standing oscillation, the mean distance l of any two adjoining Kármán vortices l
one side of the jet of current, and the velocity of travel u of the system of vortices.
Headings: **1. Ocean current effects on bays 2. Kármán vortices.**—*Authors' abstract.*

129M–391 551.515:551.461.2:55

Okuyama, K. and Unoki, S., **General description of storm tides on the coasts of
Journal of Meteorological Research, Tokyo, 11(6):526–536, June 1959. 6 figs., 10 ta
refs. In Japanese. **[Comments by] J. Sugiura, K. Hishida and M. Miyazaki.** *Ibid.,*
119–120, Feb. 1960. **[Reply by] Unoki.** *Ibid.,* p. 120–123. **DWB, DLC**—In order to in
the size of high-tide and meteorological factors which cause them, the authors selected
observatories which kept 5 years, observations (1924–1956, intermittent periods) and mad
showing monthly frequency of tides, the maximum tide at various coastal regions from

lso at 2 m above from 1900–55. They also show the relation between the region of high tide nd distance from typhoon centers in 1945–58, and maximum tides at Tokyo, Nagoya, Osaka, and obe. Figures show the relation between the central air pressure of typhoons at various regions nd the range of high tide, and the distribution of maximum meteorological tides as well. The onclusions can be summarized: 1) maximum tidal range was caused by typhoon, precisely, by ropical cyclone; 2) high tide along the Pacific coast occurred in August–October and less in larch–May, and tide at 2 m over was in the Bay of Tokyo and of Osaka and that at 1 m over the Bay of Kagoshima and of Ise; 3) high tide before the encroachment of typhoon occurred 8% of the time and that after the passage of typhoon by 56% throughout 39 regions. *Subject leadings:* **1. Storm tides 2. Coast of Japan.**—*K.C.*

12M–392 551.556.8:551.465.5

Pastors, A. A., **Vodoobmen mezhdu morem i zalivom cherez proliv.** [Water exchange etween a sea and a gulf through a strait.] *Lietuvos TSR Mokslų Akademija. Geologijos ir eografijos Institutas, Moksliniai Pranešimai,* Vol. 3, Geofizika Hidrologija, issued Vilna, **1956.** . 127–136. 5 figs., eqs.—The principal factor in computing water exchange between a sea and gulf is the current through a strait. A problem that is reduced to the establishment of the elationship between wind velocity and current direction. The determination of the relationship etween direction and wind intensity ,either velocity or pressure gradient) and direction and elocity of current, and the determination of the constant wind current are described and graphs iving the relationship between wind direction and mean velocity of total current and relationship etween current velocity and duration of wind are presented. It was found that with increased uration of wind action the current velocity increases gradually as the intensity of increase of urrent velocity diminishes gradually. After 20 hours the current velocity is stabilized. The urrent in the strait is quite homogeneous through its entire thickness. The wind conditions nder which a strait receives or loses water from a sea and the volume of water received or lost re determined by computing the water discharges for each wind fall by the formula $Q = F_{v0}$ os $(B - A + 90°)$ where F = area of water cross section of the current; A = azimuth of line f direction; B = azimuth of direction of flow for a given wind and v_0 = current velocity for a iven wind. The amount of rise of level of the strait in an hour is given by $\Delta h = 3600\ (Q/w)$ here Δh = rise of level in the strait; w = total area of strait in m^2. The fall of level in the trait during reverse flow and forecasts of level water discharge, wind current and water exchange or the month of Sept. are discussed with the aid of graphs. *Subject Heading:* **1. Water exchange through a strait.**—*I.L.D.*

12M–393 551.466.78

Proudman, J. (*Edgemoor, Verwood, Dorset*), **Oscillations of tide and surge in an estuary f finite length.** *Journal of Fluid Mechanics,* N. Y., 2(4):371–382, June **1957.** 3 refs., 47 eqs. **LC**—In former papers the author shows that the effect of the combination of surge and tide s to produce a lower surge at time of high tide, and a higher surge at time of low tide, given qual meteorological conditions and an estuary of infinite length so that no resonance occurs. In he present paper the author assumes an estuary of uniform cross-section, closed at one end. The inear terms are solved first and then the secondary, or non-linear, terms treated. It is shown hat for a short basin the frictional terms drop out so the surge is higher at times of high tide han at time of low tide. With a progressive wave the effect is the opposite. *Subject Heading:* **. Surge effects in estuaries.**—*M.R.*

12M–394 551.466.447(210.5)

Ramanadham, R. and Sastry, J. S. R. (*both, Andhra Univ., Waltair, S. India*), **A study of he beach cycle at Visakhapatnam on the basis of wave refraction.** *International Oceanoraphic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **959.** p. 807–808. **DWB** (551.46082 I61pr)—A study of the beach profiles along five sections n the Visakhapatnam beach is briefly reported. During the course of the year, significant hanges occur, the profiles differing considerably from section to section. Wave characteristics lay an important role in transporting the sediment along the beach. Wave refraction studies how that waves are considerably influenced by both natural and man-made barriers. *Subject leadings:* **1. Beach cycles 2. Wave refraction 3. Visakhapatnam, East Coast of India.**— *.S.*

12M–395 551.461.2(261.2)

Ringe-Jørgensen, C. (*Board of Maritime Works, Danish State, Copenhagen*), **High-water roblems on the Danish North Sea Coast.** *Conference on Coastal Engineering, 6th, Univ. of lorida, Dec. 1957, Proceedings,* pub. **1958.** p. 115–133. 22 figs., 15 refs., 4 eqs. **DWB** (627

C748pr)—An investigation of how far certain geographical and meteorological conditions influe
the shape of the high water frequency curves for different localities was conducted on the Dan
North Sea Coast. The results are to be used in determining maximum flood levels. *Subj*
Headings: **1. High water levels 2. Flood levels 3. Danish North Sea Coast.**—*N.N.*

12M–396 551.

Schick, A. P. (*Dept. of Geog., Hebrew Univ., Israel*), **Marine terraces on Tiran Isla**
Northern Red Sea. *Geografiska Annaler, Stockholm,* 40(1):63–66, **1958.** 4 figs., 2 refs. **D**
—Hard, flat, coral limestone terraces overlie one-another like stairs, ranging 320–500 m
vertical extent and 6 km laterally. Illustrations show nature of these marine terraces. *Subj*
Headings: **1. Marine limestone terraces 2. Tiran Island, Northern Red Sea.**—*M.R.*

12M–397 551.501.9:551.468.6(474.3)(282

Shteinbakh, V. V. and Romashin, V. V., **Nekotorye itogi i predlozheniia (is opyta rab**
Rizhsko i ust'evoi stantsii). [Some results and proposals (based on the experimental work
the Riga Estuary Station).] *Meteorologiia i Gidrologiia,* Leningrad, No. 3:44–46, March 19
DWB, DLC—A description of of the organization and formation of the Riga Estuary Stat
and of the defects and errors encountered in its organization as an example of other such stati
established at various estuaries in the U.S.S.R. While the station has existed formally for
years as specialized subdivision it has been in operation only 3–4 yrs. During the past two
it has been collecting archival material on observations in the estuary regions of the west
Dvina, Lielupe and Gauja Rivers. This material underlies the proposed publication in 1960
The Hydrological Regime of the Western Dvina. The work of the station is at present
adequate in that its planning does not always take fully into account the means and forces of
station. Hitherto the station has not been sufficiently specialized so that data are not avail
on the penetration of sea water into the channel, tidal inflow and outflow, etc. The estu
region of rivers are characterized not only by the complexity of all hydrological phenomena
also their extreme variability which is inadequately reflected by the usual hydrological me
Thus in the Riga Marine Canal the coastal alluvial currents play an essential role but s
measurements have been made only along the coasts data are not available for the estua
Apparatus and floating stations for providing more frequent and extensive hydrological estu
data are discussed and some of the work of the Riga Estuary Station in recent years is s
marized. *Subject Headings:* **1. Estuary stations 2. Estuarine hydrography 3. Coastal**
drological studies 4. Riga Estuary Station, Latvian S.S.R.—*I.L.D.*

12M–398 551.466.32:551.465(

*Simonet, R. and Tanguy, O., **Etude statistique de la houle dans les différents ports m**
cains pour la période 1928–1952. [Statistical study of swell in various Moroccan harbors du
the period 1928–1952.] *Rabat, Morocco. Institut Scientifique Chérifien. Service de Phys*
du Globe et de Météorologie, Annales. 16:109–130, **1956.** tables, 3 refs. **DLC**—The
tistics given in the tables inserted in this article have been established, respectively,
groups of five years, groups of ten years and for the global period of twenty-five years (19
1952). The observations of the swell in Moroccan harbors were made according to a determ
scale. This statistical study shows that the yearly variation of amplitudes is avowedly ma
and is practically the same every year. Swells of amplitudes zero or lower than 0.5 m r
a maximum frequency in summer and are very rare in winter. The frequency of weak sw
from 0.50 to 1.50 m, increases regularly from Jan. to Aug. when it reaches its maximum;
this type of swell that occurs with the highest percentage in all the Moroccan harbors.
frequency study of moderated swells presents two maximums, one in Dec.–Jan., the othe
March, and a minimum during summer. A strong swell (3 to 5 m) has never been regist
on the Moroccan coast during summer; its maximum frequency is reached, in all harbors, du
Dec.–Jan. Very strong swells (5–7 m and more) are very rare and only take place in w
and more particularly during Jan. *Subject Headings:* **1. Swell frequencies 2. Swell ampli**
variations 3. Morocco.—*A.V.*

12M–399 551.4

Stewart, R. W. (*Univ. of British Columbia*), **A note on the dynamic balance in estua**
circulation. *Journal of Marine Research,* New Haven, Conn., 16(1):34–39, **1957.** fig., 4 r
12 eqs. Comment by D. W. Pritchard, p. 39. **DWB, DLC**—Because of the large tidal veloc
and small dimensions of estuaries, it is not justified to ignore the effects of the curvature of
when computing the dynamic balance of the current system. *Subject Headings:* **1. Estua**
circulation 2. Tidal currents in estuaries.—*Author's abstract.*

12M–400 551.465:551.468.6

Stewart, H. B., Jr. (*Coast and Geodetic Survey, Wash., D. C.*), **Upstream bottom currents**
iew York harbor. *Science,* Wash., D. C., 127(3306):1113–1115, May 9, **1958.** table, 5 refs.
C—Current measurements with the Roberts radio current meter were conducted during 1952
he Coast and Geodetic Survey. The analysis of recordings at 39 stations gave the net
ream movement of water near the bottom. Calculation of volume flow for nontidal currents,
data on how variations in freshwater inflow was gathered from current measurements are
ained. *Subject Headings:* **1. River bottom currents 2. Current flow measurement tech-**
es 3. New York, N. Y.—*W.N.*

12M–401 551.556.8:551.465:551.466.448

Tickner, Ernest Glenn, **Effects of reefs and bottom slopes on wind set-up in shallow water.**
S. Beach Erosion Board, Technical Memorandum No. 122, No. **1960.** 20 p. 12 figs., table,
fs., 11 eqs. **DWB** (551.46 U582b)—Wind tides in shallow water were studied in a laboratory
nel with a reef, with various widths of openings, located near the center of the channel and
various slopes of the channel bottom other than horizontal. The reef increased the set-up
a smooth bottom condition by a factor of two for a solid reef and somewhat less than this if
reef had an opening in it. The cross-sectional integration procedure adequately describes the
ace profile for the sloping bottom, while the estimated set-up assuming a constant depth equal
he deepest part underestimates the actual set-up by as much as 2.75. *Subject Heading:*
Vind waves in shallow water.—*Auhor's abstract.*

12M–402 551.465:551.468(666.8) 551.526.6:551.464

Varlet, F., **Les traits essentiels du régime côtier de l'Atlantique près d'Abidjan (Côte**
oire). [Principal characteristics of the costal regime of the Atlantic, near Abidjan, Ivory
t.] *Institut Français d'Afrique Noire, Dakar, Bulletin, Ser. A,* 20(4):1089–1102, Oct. **1958.**
B, DLC.—This study, based on a 5-yr series of observations made at Abidjan, is subdivided
ree parts. Pt. I deals with the annual regime of the principal physical and chemical char-
istics of the sea surface; it emphasizes the influence of opening up the Vridi canal on the
ne of surface waters and treats of the annual variation of temperatures (air and sea), salinity,
sparency, pH, dissolved oxygen and nutrient salts. The yearly cycles of sunshine duration
of air temperature present two maximums and two minimums. Twice a yr, i.e., from Jan. to
ch and from July to Sept., the sea temperature is lower than the temperature of air. A
ionship is established between the annual variation of the sea temperature and the wind
ne. Pt. II is devoted to the vertical distribution of the various physical and chemical elements.
III relates to dynamical phenomena: swell, currents, transport of sand along the shore, etc.
g the Ivory Coast, the tide is of the semi-diurnal type with a strong daily irregularity. The
l undergoes an annual variation which is influenced by the depressions of the polar front and
e center of high pressures over the South Atlantic. The author considers also the mechanism
and creeping along the shore and along a beach, as it is related to beach contour fluctuations.
ect Headings: **1. Oceanic chemistry 2. Sea-air relationships 3. Sea temperature and**
l regime 4. Sand transport 5. Abidjan, Ivory Coast.—*A.V.*

12M–403 551.468.1

Zenkovich, V. P., **O novykh rabotakh po izucheniiu dinamiki morskikh beregov.** [New
stigations on the dynamics of sea coasts.] *Meteorologiia i Gidrologiia,* Leningrad, No. 10:
7, Oct. **1957.** 3 figs. (incl. photo), 16 refs. **DWB, DLC**—The author summarizes the results
tudies on the behavior of bottom waves along the shores of the Black Sea with the aid of
rical recorders. The asymmetrical properties acquired by the wave elements are described
indicated by a graph which shows the mean values of the asymmetry of internal properties
aves in waters along deep and shallow shores, namely, the ratio of duration of ridge and
gh on the surface, ratio of duration of action of direct and reverse currents of water in the
om layer asymmetry of mean pressure, etc. For each phase the pressure curve increases from
to a maximum and falls again. During this time interval the curves pass through values of
ng velocities corresponding to the size of the particles. The "total conditional impulse"
rmining the movement of each particle of different size can be determined for each duration
e record. The study of the longitudinal mixing of sand from sea bottom and currents was
stigated by means of luminescent organic dyes which are carried on the surface sand grains
ery fine films. Also the structure of rather thick strata of sediments deposited on the bottom
on the coast were investigated with the aid of vibrating piston bottom tube, in order to study
ormation of coasts. An illustration of this device is presented. *Subject Headings:* **1. Wave**
on 2. Sand transport 3. Coast formation 4. Black Sea Coast.—*I.L.D.*

PHYSICS AND CHEMISTRY OF COASTAL WATER

12M–404 537.56:551.464:551.468.6(

Almazov, A. M., **A sootnoshenii kontsentratsii ionov v vode otkrytykh limanov.**
the proportions between ion concentrations in waters of open estuaries.] *Akademiia Nauk*
Doklady, 108(5):833–835, June **1956.** table, 3 refs., 8 eqs. **DLC**—Equations for deter
the concentration of any ion or total number of ions in the waters of open estuaries in
both fluvial and sea waters mix and data illustrating the salinity of waters of the Dniest
Dnieper estuaries determined by analysis and calculation are presented. The derivation
equations is presented and modified formulas for simplyfying calculations and rendering
more precise are developed and their use for calculating ion exchange between fluvial a
waters are illustrated. *Subject Headings:* **1. Estuarine salinity measurements 2. Ion c**
trations in estuaries 3. Dniester estuary, Black Sea 4. Dnieper estuary, Black Sea.

12M–405 551.468.6(

*Burt, Wayne V. and McAlister, Bruce, **Hydrography of Oregon estuaries, June 1**
September 1958. Oregon. State College, Corvallis. School of Science, Contract Nonr 128
Project NR 083-102, Data Report No. 3, Oct. **1958.** 18 p. Almost entirely tables.
(M(051) 066da 1956–58) (On cover page, name spelled McAllister)—Unpublished hydro
data for Oregon estuaries (Alsea, Columbia, Coos, Nehalem, Netarts, Siletz, Siuslaw, Till
Umpqua, and Yaquina) which were collected by Oregon State College between June 1956 an
1958 are tabulated. *Subject Headings:* **1. Hydrographic data 2. Estuaries of Oreg**
Estuarine hydrography.—*Authors' abstract.*

12M–406 551.46.072:55

Dorrestein, R. (*K.N.M.I., DeBilt, Netherlands*), **The use of a matrix-function for d**
ing the longitudinal transfer of matter in a steady-state estuary. *International Oceano*
Congress, 1st, N. Y., 1959, Preprints of abstracts of papers. Issued Wash., D. C., AAAS
p. 685–688. 3 figs., 5 eqs. German summary p. 687–688. **DWB**—A mathematical m
presented which may be used to describe the longitudinal migration of any conservative
of a dissolved substance, or of light-suspended particles, or of the water itself, along the
of a steady-state estuary with periodic tides. The model in principle, is similar to that p
by Stommel (1953). *Subject Headings:* **1. Steady-state estuaries 2. Tidal estua**
Estuarine hydrography.—*I.S.*

12M–407 551.463.6:551.526.6(2

Frassetto, Roberto (*Col. Univ. Hudson Lab., Dobbs Ferry*), **A preliminary survey of**
microstructure in the Strait of Gibraltar. *International Oceanographic Congress, 1st,*
1959, Preprints of abstracts of papers. Issued Wash., D. C., AAAS, **1959.** p. 689–6
French summary p. 691. **DWB**—A continuously recording thermistor chain developed
Woods Hole Oceanographic Institution was used to make a synoptic thermal survey of the
sill of the Strait of Gibraltar in 1958. The vertical oscillations of the boundary laye
divides the lower Mediterranean from the upper Atlantic water, the effect of Coriolis f
the character of the local waves studied during the survey are briefly described. *Subject H*
1. Thermal microstructure of straits 2. Synoptic thermal surveys 3. Strait of Gibralt

12M–408 525.6:551.466.78

Hughes, P. (*Dept. Oceanog., Liverpool*), **Tidal mixing in the Narrows of the**
Estuary. *Geophysical Journal,* London, 1(4):271–283, Dec.**1958.** 8 figs., 2 tables, 6 ref
lish summary p. 271. **DWB, DLC**—Observations of salinity in the Narrows of the River
have shown that vertical mixing due to tidally induced turbulence may be complete and
As tidal currents abate horizontal differential velocities, which constitute a seaward flo
upper layer and an upriver flow near the bottom, become apparent and produce vertical
gradients. A second series of observations showed that vertical homogeneity may not be
at any stage of the tide if the riverflow is high. Applying the theory for a verticall
estuary, coefficients of longitudinal eddy diffusion were computed for a low riverflow of
and gave a mean value of 160 m²/s. During a period of greater fresh water influx (
when conditions were less clearly defined, the average coefficient was considerably highe
m²/s. *Subject Headings:* **1. Tidal mixing in estuaries 2. Estuarine salinity measu**
3. Mersey Estuary, Eng.—*Author's summary.*

12M–409 551.466.78:551.

Ichiye, Takashi (*Ocean Inst. Fla., State U. Tallahassee*), **A preliminary study on**
drography of tidal estuaries on the northern Gulf Coast of Florida. *International*

phic Congress, 1st, N. Y., Preprints of abstracts of papers. Issued Wash., D. C., AAAS, **9.** p. 693–694. German summary p. 694. **DWB**—The hydrographic data of salinity varia- due to tidal currents for three shallow bays on the northern Gulf Coast of Florida are cribed. The data indicate remarkable contrasts. The salinity is almost uniform vertically Alligator Harbor. In Ochlockonee Bay, on the other hand, the surface, as well as bottom inity changes by more than 10°/00 during one cycle. The third case, St. Andrews Bay, is an tance of more complex features of salinity change owing to the configuration of the bay. The a show that the northern and the southern parts of the bay are governed by quite different usion processes. *Subject Headings:* **1. Estuarine hydrography. 2. Tidal estuaries 3. tuarine salinity measurements 4. Northern Gulf Coast of Florida.**—*I.S.*

12M–410 551.466.78:551.464/5:532.517.4(282.6)

Kent, Richard E. and Pritchard, D. W. (*both, Chesapeake Bay Inst., Johns Hopkins Univ.*), **test of mixing length theories in a coastal plain estuary.** *Journal of Marine Research*, New ven, Conn., 18(1):62–72, June 30, **1959.** 4 figs., table, 8 refs., 12 eqs. **DWB, DLC**—servations of vertical and horizontal variations in salinity and velocity in the James River uary have been previously employed in the indirect determination of the vertical eddy flux of t $(v_2's')$ (Pritchard, 1954). This term is employed here to compute a mixing length after definition of Prandtl. It is shown that this observed mixing length is qualitatively similar a theoretical one formulated from the geometry of the system and a stability parameter related the density stratification of the system. Several alternate hypotheses regarding the theoretical xing length are tested. It is found that better quantitative agreement is obtained when the luence of surface wind waves is included in the formulation of the theoretical mixing length. *bject Headings:* **1. Estuarine density stratification 2. Mixing length theories 3. Estuarine inities 4. James River, Va.**—*Authors' abstract.*

12M–411 551.468:551.464:546.17/8

†Ketchum, Bostwick, H.; Vaccaro, Ralph F. and Corwin, Nathaniel (*all, Woods Hole Oceanog. st.*), **The annual cycle of phosphorus and nitrogen in New England coastal waters.** *Journal Marine Research*, New Haven, Conn., 17:282–301, **1958.** 8 figs., 6 tables, 23 refs. **DWB, C**—Distributions of phosphorus and nitrogen in New England coastal waters at various times year are described. In surface waters the nitrate-nitrogen content is sometimes completely hausted, even though small concentrations (0.2–0.5 μg-at/1) of phosphorus are always available. e ratio of concentrations by atoms, $N:P$, varies in surface waters from maximum values of out 10:1 to values approaching zero as the nitrate is exhausted. However, the ratio of nge, $\Delta N:\Delta P$, is approximately 15:1 except during summer months when it decreases. During mmer, vertical mixing supplies nitrogen and phosphorus to the euphotic zone at higher ratios n the ratios of concentration in the euphotic zone. In deep offshore waters the $N:P$ ratio about 12.5:1, and no significant seasonal variation in either the phosphorus or nitrate concen- tion at the oxygen minimum-nutrient maximum layer could be detected. *Subject Headings:* **Phosphorus in coastal water 2. Nitrogen in coastal water 3. Oxygen in coastal water New England coast.**—*Authors' abstract.*

12M–412 551.44:551.468

†Kuščer, Ivan, **Krăski izviri ob morski obali.** [Karst sources at the sea coast.] *Slovenska ademija Znanosti in Umetnosti, Ljubljana. Razred za Matematične, Fizikalne in Tehnične de, Razprave, Ser. A.* (*Matematične, Fizikalne in Kemicne Vede*), Vol. 1:97–147, **1950.** 6 figs., les, 46 refs., 8 eqs. English summary p. 138. **DWB, DLC, CU**—The sources in coastal ions of the karst show some phenomena which are worth attention. Some of the sources are the coast itself or at most some meters above the sea level, while some are emerging at sea tom. Almost all sources become more or less brackish in dry season, but they loose their inity in rainy season again. The brackish sources are supposed to be connected with holes ich are swallowing sea water (sea swallow holes). Some submarine sources stop to run in ery dry season and change into swallow holes; they may be called sea estavelles. The coast rces take part in the turn of the tides. They become stronger at high tide and they weaken ebb. If they are brackish, their salinity increases and decreases also, but usually with some ardation. Fischer has collected the older literature concerning these phenomena. Informa- n about sources on the Yugoslav coast may be found at Milojevic. Only three sea estavelles recorded in the literature: one in South France, one near Opatija in Istria, and one at Kotor. e only known case of permanent sea swallow holes are the sea mills of Argostoli (Cephalonia), ich have been the object of numerous theories. *Subject Headings:* **1. Karst formation 2. allow holes 3. Sea estavelles 4. Yugoslav Coast.**—*Author's summary.*

12M–413 551.468:551.464:5

Laevastu, Taivo and Thompson, Thomas G. (*both, Dept. Oceanog., Univ. Wash., Sea* **Soluble iron in coastal waters.** *Journal of Marine Research,* New Haven, Conn., 16(3):192- Oct. 15, 1958. 3 tables, 16 refs. **DWB, DLC**—Soluble iron, defined as the amount of the ele found in a unit volume of millipore-filtered sea water, after oxidation of organic matter, has determined on samples collected in inshore waters of the State of Washington. After filtr the samples were oxidized. The particulate matter and its iron content were also determ Bathophenanthrolene was the reagent used. Analyses showed a variation in soluble iron rar from 5.5 to 32 μg/1; the particulate matter varied from 700 to 2000 μg/1 and contained fror to 13.3% of iron. While the general conclusions on the distribution of iron in the waters o State of Washington may be valid, such values for soluble iron are high in the light of r studies by LEWIS and GOLDBERG. *Subject Headings:* **1. Iron in coastal water 2. Coa Washington.**—*Authors' abstract.*

12M–414 551.464:539.16:546.26:55

Miyake, Y.; Kigoshi, K.; Sigiura, Y. and Saruhashi, K. (*Met. Res. Inst., Japan*), **A on the productivity in coastal waters by means of the radio-carbon.** *Papers in Meteor and Geophysics,* Tokyo, 5(1):89–94, April 1954. 3 figs., 2 tables, 6 refs. **DWB**—The m using radio-carbon is the best for measuring oceanic productivity today. To check and im this method, the gross production of coastal waters was studied. The procedure was almos same as that of E. S. NIELSEN. However, the direct measurement of the radio-carbon fix phytoplankton with G-M counter was standardized by measuring ionization current in the c dioxide gas by Lauritsen electroscope. As the results of observations of coastal waters, i ascertained that the diurnal change in the gross production was proportional to that of the radiation. Also it was found that the influence of the respiration of phytoplankton and the effect of vessels could be negligible. At the same time, the total amount of phytoplankto determined as gaseous carbon dioxide by ignition. The simultaneous comparison was between the productivity values by the radio-carbon method and the dissolved oxygen meth same samples and the considerable difference was found between them. *Subject Heading* **Phytoplankton productivity 2. Radio-carbon in phytoplankton.**—*Authors' abstract.*

12M–415 551.468:551.511:551.556:551.

Moon, Frank W., Jr.; Bretschneider, Charles L. and Hood, Donald W., **A method for uring eddy diffusion in coastal embayments.** *Institute of Marine Science,* [*Journal*], 14–21, July 1957. 5 figs., 21 refs., 7 eqs. **DWB.** Also in: Texas A. and M. College. De Oceanog. and Met., **Contributions in Oceanography and Meteorology,** 3(60–89):325–332, 1957. Issued 1958. **DWB**—A method of determining rate of eddy diffusion in embaymen been described. It is of value in solving problems on waste and sewage disposal and in studies where an accurate evaluation of eddy diffusion is required. *Subject Headings:* **1. C reentrants 2. Eddy diffusion in embayments.**—*N.N.*

12M–416 551.464:551.482:55

O'Brien, Morrough P. (*Univ. of Calif., Berkeley*), **Salinity currents in estuaries.** *Am Geophysical Union, Transactions,* 33(4):520–522, Aug. 1952. fig., 2 tables, ref. **DWB**—I nection with studies of the mouth of the Columbia River, extended current measurement made in the estuary; also included in the observations were several sets of salinity measur between the ocean and the upper limits of salinity. This paper summarizes these data and p an approximate method for separating the effects of tidal, fresh-water, and salinity cu *Subject Headings:* **1. Estuarine salinity measurements 2. Current measurements 3. S currents 4. Columbia River, Wash.**—*Author's abstract.*

12M–417 551.466.78:551.464:551.4

Ottmann, Francois and Ottmann, Jeanne-Marie (*both, Institut de Biologie Marine et graphie*), **La marée de salinité dans le Capibaribe.** [The salty tide in the Capibaribe.] *Universidade. Instituto de Biologia Maritima e Oceanografia, Trabaihos,* 1(1):39–49, Dec 10 figs., 2 tables. In French; Spanish and English summaries p. 49.—This study sho penetration of salinity at the mouth of the Capibaribe River, the stratification of the wa dislocation of the isohalines curves. The chemical study shows constant parallelism b variations of pH and dissolved oxygen. The variations are not linked to the saline variatio to the influence of the sun which favors the development of microorganisms, whose fund work is the chlorophylous assimilation of green algaes which are quite common in warm The study of the turbidity shows an extraordinary development of diatoms (in simbios green algaes) the existence of clay, usually in aggregates and the extreme poverty of micr *Subject Headings:* **1. Estuarine hydrography 2. Capibaribe River, Brazil.**—*Authors' a*

12M–418 551.464.32(282.6)(756)
Posner, Gerald S. (*Inst. Fish Res., Univ. of N. Carolina*), **Preliminary oceanographic stud-**
s of the positive bar-built estuaries of North Carolina, U.S.A. *International Oceanographic*
ongress, 1st, N. Y., 1959, Preprints of abstracts of papers. Issued Wash., D. C., AAAS, **1959.**
704–705. German summary p. 705. **DWB**—The study began in Oct. 1955 and has been
ncerned with hydrography, nutrient abundance and plankton ecology of the positive bar-built
tuaries of North Carolina. Data on water temperature, salinities and concentration of dis-
lved oxygen, nitrate and chlorophyll are described. *Subject Headings:* **1. Bay-built estuaries**
Estuarine hydrography 3. North Carolina.—*I.S.*

12M–419 551.468.6:551.464/5(282.6)
Pritchard, Donald W. (*Johns Hopkins Univ.*), **The equations of mass continuity and salt**
ontinuity in estuaries. *Journal of Marine Research,* New Haven, Conn., 17:412–423, **1958.**
refs., 49 eqs. **DWB, DLC**—Equations of mass (or volume) continuity and salt continuity are
eveloped for the two- and one-dimensional estuary from the basic forms of these equations in
ree dimensions. The three cases of vertical, lateral, and sectional homogeneity are treated.
ome misuses of the continuity concepts as applied to estuaries have appeared in recent literature.
hese are discussed. The effect of phase difference between tidal slack water and high tide on
e nontidal drift in sectionally homogeneous estuaries is presented. *Subject Headings:* **1.**
stuarine salinities 2. Equations of mass continuity in estuaries.—*Author's abstract.*

12M–420 551.524.4:551.579.4:551.468.2
Shaw, Jack T. and Garrison, G. R. (*both, Applied Physics Lab., Univ. of Wash., Seattle*),
ormation of thermal microstructure in a narrow embayment during flushing. *Journal of*
eophysical Research, Wash., D. C., 64(5):533–539, May **1959.** 6 figs., 2 refs. **DLC**—Thermal
icrostructure formations, coincident with the occurrence of flushing in a narrow Puget Sound
nbayment, have been observed and measured with a high-sensitivity probe. Accompanying the
rger formations which extend horizontally for thousands of yards, a microstructure is shown to
ist which consists of elongated layers extending hundreds of yds with temperature differences
less than 0.1°C. Two series of isothermal diagrams constructed from vertical temperature
easurements taken in the area during winter and summer flushing are presented to show the
anner in which such formations are developed. *Subject Headings:* **1. Thermal microstructure**
bays 2. Flushing in bays 3. Puget Sound, Wash.—*Authors' abstract.*

12M–421 525.63:551.468.6:519.24:551.464
Thomann, R. V.; Diachishin, A. N.; De Falco, P., Jr. et al., **A three cycle analysis of water**
iality variables in tidal estuaries. *International Oceanographic Congress, 1st, N. Y., 1959,*
reprints of abstracts of papers. Issued Wash., D. C., AAAS, **1959.** p. 709–711. fig. French
mmary p. 711. **DWB**—The statistical method proposed by DIACHISHIN is elaborated for the
irpose of determining the concentrations of water quality variables in tidal estuaries. In the
tended method multiple correlation techniques can be utilized to fit the available data to a three-
mponent sine curve. The approach was applied to data obtained from the Delaware River
tuary over the past nine years. Data for temperature, dissolved oxygen concentration and the
loride content of the estuary were analyzed. Results of these analyses are presented and dis-
ssed. *Subject Headings:* **1. Statistical methods in hydrography 2. Estuarine hydrography**
Water quality variables 4. Delaware River. I. Klashman, L. M.—*I.S.*

12M–422 551.468.6(282.6)
Tully, John P. (*Fisheries Res. Bd. of Canada, Nanaimo, B. C.*), **On structure, entrainment,**
id transport in estuarine embayments. *Journal of Marine Research,* New Haven, Conn., 17:
23–535, **1958.** 4 figs., 14 refs., 7 eqs. **DWB, DLC.** Abstract in: *International Oceanographic*
ongress, 1st, N. Y., 1959, Preprints of abstracts of papers. Issued Wash., D. C., AAAS, **1959.**
711–713. 5 eqs. German summary p. 713. **DWB** (551.46082. I61pr)—When fresh water
iters the surface of an embayment it moves persistently seaward. Enroute it entrains seawater
om below to form a halocline, in which the salinity increases with depth and to seaward. Wind
ixing creates a nearly homogeneous zone in the upper part of the halocline. Below the halocline
ere is a nearly homogeneous lower zone in which sea water intrudes at a rate sufficient to supply
e demand for entrainment. This fresh water transport system is superimposed on the tides
hich ebb and flood at all depths. There is a surface of no net motion in the halocline above
hich the net transport is seaward and below which it is inwards. Entrainment is the preferential
oward transfer of water from the lower to the upper zone. The downward mixing of fresh
ater is defined by the lower limit of the halocline, which is a surface of unidirectional upward
ansfer. The zone structure is accurately defined by plotting salinity as a function of the
garithm of depth. The seaward volume transport through the upper zone and halocline, the

inward transport through the lower zone, and the upward transfer through the interzone bounc may be computed in terms of the continuity of fresh water, where the rate of input is kno Where it is not known, the equations are solved by introducing the difference of dynamic he across the embayment. The features of structure and transport may be defined by applicatio normal oceanographic data. *Subject Headings:* **1. Estuarine haloclines 2. Estuarine k matics 3. Estuaries.**—*Author's abstract.*

12M–423 551.463/4:551.4

Waldichuk, Michael (*Fisheries Res. Bd. of Canada, Nanaimo, B. C.*), **Some oceanograp characteristics of a polluted inlet in British Columbia.** *Journal of Marine Research,* Haven, Conn., 17:536–551, **1958.** 4 figs., table, 9 refs. **DWB, DLC**—Physical and chem characteristics of Neroutsos Inlet, British Columbia, in Aug. 1957 are described. Modera deep, 11 naut mi long by 0.5 to 1 mi wide, it has been subjected to a prolonged period of w disposal from a sulphate pulp mill near its head. The mill effluent is discharged on the sur at the shore and is largely confined to a thin surface layer about 5 m deep. Low dissolved ox in surface water was noted and virtual extinction of intertidal flora and fauna within severa of the mill apparently has occurred. Absence of significant vertical mixing allows the deep w to remain relatively free of contamination. The Inlet lacks the mechanism of a large ru from the head for rapid flushing of wastes released at the surface. Comparison of oceanogra data collected in Neroutsos Inlet during Aug. 1927 with those of Aug. 1957 suggests that t has been a long-term change in conditions as a result of 40 yrs of continuous discharge of wastes into Inlet waters. *Subject Headings:* **1. Inlet pollution 2. Sulphur pollution in i water 3. Neroutsos Inlet, British Columbia.**—*Author's abstract.*

SEDIMENT MOVEMENT

12M–424 551.468.1:551

Borreswara Rao, C. and La Fond, E. C. (*both, Andhra Univ., Waltair*), **Sand sorting on east coast beaches.** *Current Science,* Bangalore, 25(3):77–78, March **1956.** 2 figs., 6 **DWB, DLC**—Two models of environmental conditions on the beaches on the east coast of I off Visakhapatnam, near the mouth of the Nagavali River (Bay of Bengal) are presented, one Aug. and one for Feb. showing deposition and sorting. The river sediments are deposited on N. and E. sides of the confluence and sorted by waves, currents, tides and wind. The lig material is carried away leaving heavy sands which can become stratified through seasonal a explained by these models. *Subject Headings:* **1. Sand sorting by wind and sea 2. Ba Bengal, India.**—*M.R.*

12M–425 551.468.2:55

Bourcart, J.; Boillot, G. et al, **Les sédiments profonds au large de la côte niçoise.** [sediments off the coast of Nice.] *Académie des Sciences, Paris, Comptes Rendus,* 247(1): 118, July 7, **1958.** refs. **DWB**—Between 2200 and 2600 m, the Continental slope, on the of metropolitan France and of Corsica, presents the form of regular stairs with 30 m diffe in level and generally about half a mile wide, very like sand-hills. In order to interpret strange forms, the authors made a series of dredgings and took several core-samples in this re The Gulf of Genoa seems thus to be filled up with sand carried to the lower part of the contin slope; the space occupied by the pelagic mud should decrease more and more when going tov the bottom of the gulf. At a depth greater than 200 m are found river sands with fragmen drift-wood, but containing pelagic fauna. *Subject Headings:* **1. Marine sediments 2. Pe sediments 3. Gulf of Genoa 4. Mediterranean Sea. I. Cousteau, J. Y. II. Genneaseau III. Klimek, E. IV. Lalou, C.**—*A.V.*

12M–426 551.468:551.351:551.

Cailleux, André, **Erosion et défense de la côte en Loire-Atlantique.** [Erosion and de of Atlantic-Loire shore.] *Académie des Sciences, Paris, Comptes Rendus,* 247(16):1211– Oct. 20, **1958.** 3 refs. **DWB, DLC**—The average slope of shores at the high-tide level i With this angle of natural equilibrium, the sand is detained hy means of the wharves perpendi to the shores, provided that they are kept in repair. On places where no micro-cliff exists terrestrial vegetation contributes to the fixation of sands and gravels and to the shore prote Vegetation plays an important protective part against erosion; therefore, to protect the shore should try, in certain instances, to plant vegetation more suitable for conserving the natural scape. *Subject Headings:* **1. Beach erosion 2. Wind erosion of shores 3. Shore conserva** —*A.V.*

12M–427 551.468.2:55

De las Heras, Antonio; López Costa, Rafael; Cabañas Ruesgas, Félix et al., **Análisi fondos de la Bahía Cádiz.** [Analysis of the bottom of Cadiz Bay.] *Spain. Instituto Es*

Oceanografía, Madrid, Boletín, No. 75, April 15, **1956.** 30 p. 7 figs., 6 tables, refs. **DWB** Results of chemical, physicochemical and mineralogical studies of sediment samples obtained Cadiz Bay are reported. The techniques used are described in detail. *Subject Headings:* **Sediment analysis 2. Sediment sampling methods 3. Marine sediments 4. Cadiz Bay, ain. I. Rodríguez Molíns, Lorenzo. II. Besada Rial, Jose R.**—*G.T.*

12M–428 551.351:551.468.1

†Griesseier, Helmut (*Inst. Physics, Hydrograph. Akad. Wissenschaften, Berlin*), **Über die öglichkeiten eines unmittelbaren Studiums der litoralen Materialbewegungen mit Hilfe n Indikatoren.** [Possibilities of a direct study of the movements of littoral debris by means indicators.] *Beiträge zur Geophysik,* Leipzig, 68(3):150–160, **1959.** 65 refs. German, Engh, French and Russian summaries p. 150–151. **DWB, DLC**—Waves and wave-caused currents use, in the littoral zone of the sea, material movements of considerable extent, the balance of ich decisively influences the regime of a given coast region and the study of which therefore presents a fundamental presupposition of the scientifically-founded planning and performance any hydrotechnical construction. Our article analyzes the different possibilities which tracers ord us in the study of material movement on sea coasts and particular stress is laid on the disssion of the results obtained in practical investigations. *Subject Headings:* **1. Sediment transrt along shore 2. Littoral transport of sediments 3. Sediment tracers.**—*Author's summary.*

12M–429 551.46.08:551.468.1:551.351

†Griesseier, Helmut (*Berlin-Briedrichshagne, Werlseestrasse*), **Über die Verwendung von uminoforen beim Studium der litoralen Materialbewegungen.** [Use of luminous tracers for e study of the movement of coastal materials.] *Acta Hydrophysica,* Berlin 6(1):5–42, **1959.** figs., 41 refs. German summary p. 5. **DLC**—"After a review of the various possibilities of e study of the movement of coastal material, the principles of the luminous tracers are presented, d the results of some experiments performed by their application are described." The method ed consists of marking of samples with luminous matter in order to observe their direction and eed under the influence of the predominant hydrometeorological regime. The development of e methods and instruments is explained and illustrated. The measurement of wind, water-stage, rrents, registration of surface parameters, determination of horizontal wave pressures, the alysis of concentration of the suspended material, and finally the geodetic surveying of the ole investigation area as well as a selected profile of it, complete the work. A type of a ble-railway is necessary to make the investigation in stormy weather. The cable-railway and the instruments for the above mentioned tasks and their operations are described. Among me results of preliminary operations is the unexpected high speed of sediment transport. Finally, me problems are indicated for which Russian experiments promise some solution. *Subject eadings:* **1. Sediment tracer 2. Hydrographic equipment 3. Sediment transport along ore.**—*O.T.*

12M–430 526.8:551.462(261.3):551.468.1

Groba, Egon (*Berlin-Friedrichsfelde*), **Geologische Unterwasserkartierung im Litoral der utschen Ostseeküste.** [Geological charting of bottom water along the German Baltic Coast.] *cta Hydrophysica,* Berlin, 5(4):163–200, **1959.** 15 figs., 7 photos, 16 refs. German summary 163. **DLC**—This study represents a beginning of systematic geologic mapping of the German a coast. Several sections of the Baltic Sea coast region were mapped by using light diving paratus. The various geologic phenomena are described with the aid of diagrams and maps. e contents of this paper comprise the following: geologic underwater mapping of Usedom Island d of the Baltic Sea resort Boelehagen and the general characteristics of some sediments. *Subct Headings:* **1. Coastal mapping 2. Coastal geomorphology 3. Baltic coast of Germany.** *I.L.D.*

12M–431 551.468.1:551.351 551.46.08:551.35

Gugniaev, Ia. E., **Nanosoulovitel' dlia priboĭnoĭ polosy.** [Alluvium trap for a surf area.] *eteorologiia i Gidrologiia,* Leningrad, No. 3:51–52, March **1959.** fig. **DWB, DLC**—An alvium trap is subjected to different wave conditions in a surf area from a deep water area. The thor therefore recommends on alluvium trap which can be inserted into the bottom up to the vel of the earth and does not hinder the movement of the alluvium. The device is designed operate from a scaffolding during storms. It consists of a metallic cone or pyramid having capacity of 100 cm³, a movable cover and a rod 2.5 cm in diameter. A detailed description of e construction of the trap and of its operation is presented with the aid of a photograph. *Subject eadings:* **1. Marine sediments 2. Sediment sampling methods 3. Sediment sampling in astal areas.**—*I.L.D.*

12M–432 551.351:551.482.212.3:551.

Hishida, Kozo; Tanioka, Katsumi; Yasuoka, Takeo et al. (*all, Maizuru Marine Obs.*)
the blocking of the mouth of the River Yura. *Umi to Sora* (*Sea and Sky*), Tokyo, 35(2
51–64, 1959. 16 figs., table, 2 refs. In Japanese; English summary p. 51. **DLC**—The r
flowing into the Japan Sea have generally suffered from the blocking of the estuaries. Fo
purpose of studying the causes of the building of the sand spit, the authors investigated the
ing-sand in the Yura River which may be considered to affect the growth of the split.
sampled the bottom deposits in the river and the shallow sea. They also studied some o
contributing conditions, such as wind, wave, swell and current related to this problem. The
clusion is that the causes for the growth of the sand spit are related to the hydrographic c
tions in the shallow sea. *Subject Headings:* **1. Estuary blocking 2. Sand spit forma
I. Wakabayashi, Toshio.**—*K.C. and authors' abstract.*

12M–433 551.351:539.16:55

Inman, Douglas L. and Chamberlain, Theodore, K., **Experiments with radioactive sa
a tracer of beach sand movement.** United Nations [Document] A/CONF.15/P/2357 U
June 1958. 6 p. 5 figs., 2 tables, 7 refs. At head of t-p.: **Second U. N. International
ference for the Peaceful Uses of Atomic Energy. DLC.** Reprinted as *California. Univ. S
Institution of Oceanography, Contributions, 1958,* issued **1959.** p. 527–540. **DWB** (5
C153co 1958)—Until recently there has been no satisfactory means of tagging sand size ma
so that the movement of sand could be studied in the beach and nearshore zone. The adve
readily available high flux neutron sources for activating sand samples has given impet
studies involving the tracing of sediment movements. The purpose of this investigation w
perfect a field technique using low levels of radioactivity in sands that would be suitabl
studying sand movements on populated swimming beaches, and to apply this technique in stu
the rate of dispersion of sand under wave action near shore. Previous work with radio is
as tracers of sand has principally been confined to the use of foreign particles such as g
glass, which are added to the sand under study, and which in general have employed lev
activity too high for use along California beaches (Hours et al., 1955; Inose and Shir
1956; Putman and Smith, 1956; Arlman et al., 1957). Also, foreign particles are not u
suitable for beach sand tracers because their hydraulic behavior may be different from that
natural sands. To be satisfactory, the natural tracer of sand movements should be: (1)
health hazard, (2) of the same size distribution, density, and shape as one of the major
ponents under study, (3) easily and rapidly distinguishable from the sand mass, (4) inexp
an available in relatively large amounts, (5) able to retain its distinguishing properties over
comparable to the times of the fluid processes. Thus, the problem was to seek out a trace
would fulfill these requirements, and to develop field techniques that could be used in the d
conditions encountered near the surf zone. *Subject Headings:* **1. Sand tracers 2. Beach
movement.**—*Authors' abstract.*

12M–434 551.351:5

Inman, D. L. and Chamberlain, T. K. (*Scripps Inst. of Oceanog.*), **Tracing beach
movement with irradiated quartz.** *Journal of Geophysical Research,* Wash., D. C.,
41–47, Jan. **1959.** 5 figs., 2 tables, 8 refs. **DLC**—The mechanics of transportation of sand
the influence of wave action was studied using artificially induced radioactivity. A sam
naturally occurring quartz sand is taken from the area of study, subjected to slow neutron i
tion, and then reintroduced into the area. The movement of the quartz is traced by sampl
sediment on the bottom and assaying for phosphorus-32, which is the principal radio isotope
from the slow neutron irradiation of natural quartz sands. In a field experiment, 86
irradiated quartz sand was reintroduced at a point source on the sea floor off Scripps
The experiment showed that the dispersal of sand by wave action was more rapid than ex
and that the movement of this small amount of sand could be followed for about 7 to 24 hr
irradiated sand was released on the bottom by divers and samples were obtained on a grid
time intervales of ¼, 1, 3½, 7½, and 24 hr, and several days later. At the point of intro
the water was 10 ft deep and the surface waves were about 1¼ ft high. The waves cau
sand to spread in an elliptical pattern with an elongate onshore-offshore axis. The sa
indicated that the 860 g of irradiated fine sand had been dispersed over an area of approx
three-quarters of a sq mi in 24 hr. The sensitivity of detection for this experiment
proximately 1 grain of sand in 100,000. *Subject Headings:* **1. Beach sand movement 2
tracers 3. Sand transport by waves 3. Scripps Beach, Calif.**—*Authors' abstract.*

12M–435 539.16:551.46:551.468

†Jaffry, Pierre (*Lab. National d'Hydraulique*) and Hours, Richard (*Commissariat à l
atom. Centre d'études nucléaires de Sacaly*), **L'étude du transport littoral par la métho**

aceurs radioactifs. [Study of coastal transport by means of radioactive tracers.] *France. omité Central d'Océanographie et d'Etudes des Côtes, Cahiers Océanographiques,* 11(7) : 475–498, ly/Aug. **1959.** 11 figs., 3 tables, 30 refs. **DLC, DWB**—A study of the littoral transport of diments by wave action along the coast. A brief discussion of the feasibility of using various dioactive tracers and a report on the methods used by investigators at the National Laboratory Hydraulics at Chatou. Similar studies made elsewhere are listed and compared with results tained here. Some of the results are given graphically. Both schematic drawings and photoaphs of the equipment used are included. *Subject Headings:* **1. Sand tracers 2. Sand transrt by waves 3. Chatou, France.**—*E.ZS.*

12M–436 551.351:551.468

Kidson, C.; Carr, A. P., and Smith, D. B., **Further experiments using radioactive meths to detect the movement of shingle over the sea bed and alongshore.** *Geographical Jourl,* London, 124(2) ; 210–218, June **1958.** 6 figs., 2 plates, 2 tables, 10 refs. **DLC**—Experiments ere conducted off Orfordness in Suffolk, Eng. from Jan. through March 1957 although some rlier work on the movement of shingle over the sea bed had been done at Scott Head. The rfordness experiment shows how beach material moves alongshore under various conditions and more than one direction. River mouths, even where the flood and ebb tides reach very high locities, are no barrier to the longshore movement of beach sediment. The following subjects e discussed: the choice of tracer, the marking of pebbles, instrumentation and tracing, control d plotting, weather records, the site of the experiments, the movement in the offshore zone, and e longshore movement. *Subject Headings:* **1. Shingle tracers 2. Shingle transport 3. Sufk Coast, Eng.**—*N.N.*

12M–437 551.351

Kuznetsov, A. M. and Kuznetsov, V. A., **O svoistvakh i prirode sharovoĭ formy morskoĭ l'ki.** [Properties and nature of spherical sea pebbles.] *Akademiia Nauk SSSR, Izvestiia, Ser, ofiz.,* No. 8:1247–1250, Aug. **1959.** 3 figs., 2 tables, 6 refs. Transl. into English in the corsponding number of its *Bulletin of the Academy of Sciences, USSR, Geophysics Series.* **DWB, LC**—Characteristics of sedimentary and volcanic rocks of spherical shape and of various sizes are scribed in detail and tabulated data of their composition and density are given. The nature of eir formation is related to the regularity of movements between harder types of rocks. *Subject eadings:* **1. Marine sediments 2. Sediment analysis 3. Spherical sea pebbles.**—*N.P.S.*

12M–438 551.468:551.351.2(267)

La Fond, E. C. and Prasada Rao, R., **Beach erosion cycles near Waltair on Bay of Bengal.** *ndhra Univ., Waltair, India, Memoirs in Oceanography,* 1:63–77, **1954.** 10 figs., 4 refs., eqs. **LC** (GC1.A55)—The cyclic movement of beach sand was observed by repeated measurements at altair Beach near Andhra University. The simple instrument used was an eight foot long mboo stick on which black graduations in inches and feet were painted on the white surface. the base the stick has a radius of 1 in. As a length measure it is used for the 8 ft distance tween the stations points, as a "penetrometer" it measures the compactness of sand when eighted down with an eight pound rock and it serves as a land surveyor's stick to give difference inches and feet when the observer sights by eye over a plane "reference rock" placed trigonoetrically on an elevated sand dune. The difference in cycles of sand movement can exceed 10 m d is caused by tides, wind, and wave action. *Subject Headings:* **1. Sand transport 2. Beach osion cycles 3. Waltair, India.**—*W.N.*

12M–439 551.468.6:551.351

Ottmann, François and Ottmann, Jeanne-Marie (*both, Institut de Biologie Marine et Océanoaphie*), **Les sediments de l'embouchure du Capibaribe.** [Sediments in the estuary of the ipibaribe River.] *Recife. Universidade. Instituto de Biologia Maritima e Océanografia, abalhos,* 1(1):51–69, Dec. **1959.** 3 figs., table, 16 refs. In French; Spanish and English mmaries p. 67–68.—A study of the sediments of the Capibaribe river estuary shows that sedients of the bed of the river are generally coarse sand derived from the reworking of the uvium from the banks and bed which are dredged out by tidal currents directly from these astal plain deposits. The Capibaribe river, almost without force during the summer low stage insports only fine sediments, principally clays, which are deposited on the banks. These deposits e in the form of mud clay resulting from the sedimentation of flakes and aggregates during the ick between tides. There is little or no calcium carbonate present in the sediments but there is great quantity of organic matter and organic carbon, with very high C/N ratio values. *Subject eadings;* **1. Estuarine clays 2. Capibaribe River, Brazil.**—*Authors' abstract.*

12M–440 551.468.1:551

Rivière, André, **Sur la notion de dispersion littorale.** [On the notion of littoral dis sion.] *Académie des Sciences, Paris, Comptes Rendus,* 249(19):1920–1922, Nov. 9, **1959.** 5 **DWB, DLC**—Classical notions are sufficient to account for dispersion (erosion and recessio certain shores). Coastal dispersion is effected by a certain number of phenomena: a) excepti storms, often attended by tide-races, which provoke the carrying away of coastal sediment unusual depths; b) the dragging along through floatation; c) the crumbling of sedimen detritus; d) the density currents which can wash away the coastal sediments to great depths remote distances off shore. *Subject Headings:* **1. Coastal erosion 2. Severe storm effects shores 3. Tidal effects on erosion.**—*A.V.*

12M–441 551.468.1:551.351:551

†*Stewart, Harris B., Jr., **Sediments and the environment of deposition in a coastal lag** Feb. **1956.** Thesis (Ph.D.)—Univ. of California, Los Angeles. 354 p. 73 figs. (incl. phot tables, bibliog. p. 302–320.—Study of the environment of deposition at San Miguel Lagoon, California, Mexico, shows a wide range of variation of all measured factors. The extent of bay barrier at any time is the result of processes acting upon it and exercises a marked co on the environmental variations within the lagoon. When the lagoon is closed from the o bottom water temperature variations with time are so large that temperature variations place to place are masked. Chlorinity, on the other hand, varies so slowly with time that variations are meaningful; and when the barrier is open, chlorinity profiles reveal the exten the tidal mixing. Dissolved oxygen and pH vary both diurnally and areally, and these varia are used to delineate five aqueous environments within the lagoon. Minor sedimentary struc on the bay barrier and within the lagoon reflect the processes in operation, and highly cont sediments are explained by laboratory experiments. Wind action is evaluated as a source lagoon sediments, and an hypothesis is proposed to explain the concentration along this coa rounder quartz grains and more heavy minerals in the dunes than on the upwind beaches. Pos criteria are suggested for the recognition of coastal lagoon sediments in the ancient rocks. *ject Headings:* **1. Coastal lagoons 2. Marine sediments 3. Chemistry of lagoons 4. Miguel Lagoon, Mexico.**—*From author's abstract.*

12M–442 551.468.3:551.314:551.464.1(2

†Stewart, Harris B., Jr. (*Coast and Geodetic Survey, Wash., D. C.*), **Sedimentary reflec of depositional environment in San Miguel Lagoon, Baja California, Mexico.** *Ame Association of Petroleum Geologists, Bulletin,* 42(11):2567–2618, Nov. **1958.** 30 figs., 3 t 71 refs. **DLC**—The environment of deposition at San Miguel Lagoon is characterized by ranges in the measured factors. When the lagoon is isolated from the ocean, large fluctu in bottom-water temperature with time mask any variations from place to place. Chlorinit the other hand, changes so slowly with time that areal variations are meaningful. Diss oxygen concentration and pH vary diurnally and areally, and these variations are used to del five aqueous environments within the lagoon. Three different types of sediment within the l are related to the following processes of transportation and deposition: wave processes, processes, and slow deposition from quiet water. Analyses of sediments from other west lagoons show that these same processes may be inferred. Distribution of Foraminifera reflec influence of the barrier in restricting water exchange with the ocean. Calcium carbonate in the sediments are low (0.2–2.3 per cent), and the erratic distribution pattern results variations in the sources, rate of dilution, and physico-chemical factors. In a lagoon where amounts of organic material are contributed, low values for the organic carbon content sediments (0.36–5.60 mg/g) are attributed to a high rate of decomposition. Higher organic values are found in the finer-grained sediments. The sediments reflect the overlying wa only those areas where they are genetically related to that water. In these areas lower c carbonate content was found in sediments underlying water with lower pH. Finer siz accompanied by less dissolved oxygen in the overlying water, and higher organic carbon occurs with less dissolved oxygen and lower pH in the overlying water. Inferences are from this study about the nature of ancient coastal lagoon deposits. *Subject Headings:* **1. N sediments 2. Lagoonal sediments 3. Chemistry of lagoon 4. San Miguel Lagoon, M** —*Author's abstract.*

12M–443 551.462:55

Stride, A. H. (*National Inst. of Oceanog., Wormley, Surrey*), **A linear pattern on t floor and its interpretation.** *Marine Biological Association of the United Kingdom, J* 38(2):313–318, June **1959.** fig., table, plate (photo), 9 refs. **DLC**—The sea floor in t between Start and Dodman Points, near Plymouth, Eng. was surveyed in April and in Sept

The echo ranging equipment had a frequency of 37 kc/s, pulse length 1 ms, horizontal beam shape 1.8°, vertical 11° with four side lobes, tilt angle 5–7° below horizon. A sample record of 732 m (800 yds) horizontal scale shows the action of the tidal stream on the flat floor by the presence of well-defined 3 in high sand waves interspaced at 100 to 250 m. The lithology of 5 cores taken is tabulated. *Subject Headings:* **1. Tidal action 2. Bottom sampling 3. Sand waves 4. Plymouth, Eng.**—*W.N.*

12M–444 551.468.1:551.351

Tanner, William F., **The equilibrium beach.** *American Geophysical Union, Transactions,* 39(5):889–891, Oct. **1958.** 6 refs. **DWB, DLC**—The equilibrium beach has curvature and sand-prism characteristics adjusted to each other so delicately that the potential littoral motion provides precisely the energy needed to transport the detritus supplied at the up-current end. The time element in this balance is long-term rather than instantaneous. A beach which performs in any other way is not in equilibrium. The maintenance of certain beaches in equilibrium form is of great economic or political importance. The most pressing case of inequilibrium is that of the rapidly retrograding beach. In many instances the beach can be restored to an equilibrium condition by decreasing the actual littoral drift or increasing the available supply of sand. *Subject Headings:* **1. Beach equilibrium 2. Beach conservation 3. Shore protection measures.**—*Author's abstract.*

SEA LEVEL

See also: **Oceanography in IGY** (Deacon), 12M–53; **Temperature oscillations with tidal period** (Selitskaia), 12M–154; **Fluctuations of Kuroshio** (Moriyasu), 12M–970.

12M–445 551.461.2:551.461.8

Curray, Joseph R. and Shepard, Francis P. (*both, Scripps Inst. La Jolla, Calif.*), **Sea-level rise along the Texas coast.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 609–610. fig. French summary p. 610. **DWB** (551.46082 I61pr)—The numerous samples of the shelf off Texas and the borings in Texas bays have yielded information needed to date the rise of sea level during the waning of the last great continental glaciers. A graphical comparison of the dates derived from the Texas area with dates from various other stable coasts of the world shows a considerable degree of similarity. The information indicates a rapid rise in the sea level from some time before 17,000 B.P. until about 6000 to 7000 B.P. *Subject Headings:* **1. Sea level variations 2. Pleistocene glaciation 3. Texas.**—*I.S.*

12M–446 551.461.2:551.461.8:551.583.3

Fairbridge, Rhodes W. (*Dept. Geology, Columbia Univ.*), **Periodicity of Eustatic oscillation.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 97–99. German summary p. 99. **DWB** (551.46082 I61pr)—Based on radiocarbon dating the glacial peaks, inter-glacial plateaus and mean sea level extremes of the Quaternary are presented in tabular form. The data show a "deglacial geoid" demonstrating a long period lowering of sea level from early to late Pleistocene of about 0.3 mm per year. This long period oscillation is not due to climatic influence; the cause may well be tectonic-eustatic, associated with the secular submergence of semicontinental crust producing basin deepening in the Mediterranean, East and West Indies, Melansia, etc. *Subject Headings:* **1. Sea level variations 2. Eustatic changes in sea level 3. Tectonic influences on sea level 4. Mediterranean Sea 5. West Indies 6. Indonesia.**—*I.S.*

12M–447 551.461.8:539.16:546.26

Godwin, H.; Suggate, R. P. and Willis, E. H. (*all, Univ. Sub-Dept. of Quaternary Research, Botany School, Cambridge*), **Radiocarbon dating of the eustatic rise in ocean-level.** *Nature,* London, 181(4622):1518–1519: May 31, **1958.** fig., table, 13 refs. **DWB**—Radiocarbon dating has been a means of securing absolute dates for the submerged peat beds and former strand lines which are evidence of former transgressions. This method was used to date samples taken from Christchurch, New Zealand and those from the Mississippi delta region and other world areas. Conclusions from the study of the specimens are identical with those previously arrived at in Great Britain, although the results differ from those reported in 1957 in *Science,* 123, 1082 **(1957)** as this latter work shows that the level of the oceans attained that of the present day about 5500 years ago rather than in recent times. *Subject Headings:* **1. Sea level changes 2. Radiocarbon dating 3. Christchurch, New Zealand 4. Mississippi Delta.**—*N.N.*

12M–448 551.461.2 551.462:551.35.054.13(26

Wang, Chao-Siang (*Scripps Inst. La Jolla, Calif.*), **Coastal terraces and relative sea lev changes.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of pape* Issued Wash., D. C., AAAS, **1959.** p. 666–668. In English and French. **DWB**—Results investigations along some of the coastal areas and in the Gulf of California, Mexico are reporte These investigations show that whereas terraces of the marine type can be used as clues for t determination of relative sea level changes, the same is not true of terraces of fluvial type. T races of fluvial origin are quite different, and are therefore quite misleading in efforts to determi sea level changes. *Subject Headings:* **1. Coastal terraces 2. Sea level changes 3. Taiw 4. Gulf of California, Mexico.**—*I.S.*

SEA LEVEL VARIATIONS

12M–449 551.465:551.461.2(26

Balay, Marciano A., **La determinación del nivel medio del mar argentino; influencias las oscilaciones del mar no causadas por la marea.** [Determination of the average height the Argentina Sea: influences of the oscillation of the sea, not caused by the tide.] Buen Aires, Ministerio de Marina, Dirección General de Navegación e Hidrografía, Departame Oceanografía, **1955.** 46 p. 23 figs., tables, 19 refs. **DLC** (GC541.B3)—Dynamic aspects the Argentine Sea are described and tidal variations in sea level noted. Other forces responsi for variations in sea level—seiches, storms surges and atmospheric pressure changes are explai and references given to several events. Much of the data is treated statistically. *Subject He ings:* **1. Sea level variations 2. Tidal variations 3. Argentine Sea, Atlantic Ocean.**—*E.Z*

12M–450 551.461.2(262

Berenbeĭm, D. Ia., **O kolebaniiakh srednegodovogo urovnia Azovskogo moria.** [Va tions in the mean annual level of the Sea of Azov.] *Meteorologiia i Gidrologiia,* No. 12:32– Dec. **1959.** fig., table, 4 refs., eq. **DWB, DLC**—Variations in the sea levels between the A and Black Seas observed from 1924 to 1956, are discussed in relation to the runoff of Dnieper, Danube and Don Rivers. The data on fluctuation of the levels are tabulated graphically illustrated. *Subject Headings:* **1. Sea level variations 2. Sea of Azov 3. Bl Sea.**—*N.P.S.*

12M–451 551.466.44:551.461.2:551.46

Bremond, Jean-Claude, **Enregistrement des temps d'immersion à différents niveaux, aux nappes d'eau induites par les vagues se brisant sur une paroi rocheuse.** [Recording submergence duration at various levels, owing to water-sheets induced by waves combing o rocky wall.] *Vie et Milieu,* Paris, 9(3):257–277, **1958.** 9 figs.—Study of the behavior water-sheets induced by waves above the mean level, and analysis of the local oscillation of water level provoked by the arrival of waves on the coast. Descriptions are given and functi ing of the device permitting the simultaneous accurate measurements of the frequencies durations of immersion at various levels along a rocky wall are explained. Statements are m on the conditions realized in order to make recordings possible and to make possible study of recordings of submergence durations at various levels on a vertical wall exposed to waves. hypothesis that the distribution of the amplitudes of water-sheets resulting from the im of waves on a vertical wall should be a Poisson type distribution, is proved experimentally a good approximation. The author makes a theoretical study of the distribution of the ver velocities of water-masses along a wall, with respect to elevation and to the distribution of velocity of sheets at the various heights. *Subject Headings:* **1. Sea level variations 2. W impact 3. Vertical velocity of water masses 4. Banylus-sur-Mer, France.**—*A.V.*

12M–452 551.468.1:551.556.8:551.4

Chase, Joseph (*Woods Hole Oceanog. Inst., Woods Hole, Mass.*),**Wind-induced cha in the water column along the East Coast of the United States.** *Journal of Geophysical search,* Wash., D. C., 64(8):1013–1022, Aug. **1959.** 12 figs., 9 refs. **DLC**—Two types changes in the water column at certain lightships are linked to the wind pattern. In one there is a replacement of the whole water column, whereas in the other there is a fluctuatio the thickness of the upper layer. *Subject Headings:* **1. Wind effects on sea level 2. coast of United States.**—*Author's abstract.*

12M–453 551.5:551.4

Duvanin, A. I., **Issledovaniia urovnia Mirovogo okeana.** [Invstigations of the leve the world ocean.] *U.S.S.R. Glavnoe Upravlenie Gidrometeorologicheskoi Sluzhby. Komite Provedeniiu Mezhdunarodnogo Geofizicheskogo Goda, Informatsionnyĭ Sbornik,* No. 4:62 1957. 2 figs. **DWB**—The periodic variations in the level of the world ocean are the resu the wind regime and atmospheric pressure which are associated with the intramural and se iations in sea level. Contemporary studies have demonstrated a connection between variations level as recorded by coastal tide waters and oscillations of the water surface over extensive as of the open ocean. The oscillations of the mean annual elevations of water level at Bombay associated with secular oscillations of water level in the Mediterranean (Marseilles) and even the Black Sea. This relationship extents as far as the Atlantic Ocean. The unity of the ter level regime in regions with distinct monsoonal circulation is completely confirmed by data the seasonal oscillations of sea level even in different oceans. Monotypical graphs of the sonal sea level oscillation at different points (Baltimore, Manila, Mergui in the Bay of Bengal) icates this relationship. From the regime of oscillation of sea level it is possible to determine regions where the monsoon circulation is completely destroyed. These regions are the western sts of Europe and North America which are subject to the effect of west-east transport. cular curves of the mean annual water level heights at the windward coasts of continents mani- t the differences in the variability of the west-east transport of the Northern Atlantic and rthern Pacific. Graphs are presented showing that the annual variation of the mean water el at the western coasts of continents corresponds to the annual variability of the west-east nsport. At the same time these curves show a variability opposite to the annual oscillation of level of monsoonal type. The explanation given by V. V. SHULEĬKIN for this contrasting iation is presented, and the general relation between the general atmospheric circulation proc- es and oceanic water level variations and the data to be obtained during the IGY on this phe- nenon are discussed. *Subject Headings:* **1. Weather effects on sea level 2. Sea level riations 3. World ocean.**—*I.L.D.*

12M–454 551.5:551.461.2

Duvanin, Aleksandr Ivanovich, **Uroven' moria.** [Sea level.] Leningrad, Gidrometeoizdat, **6.** 58 p. 20 figs., 2 tables, 4 refs., 14 eqs. **DLC** (GC89. D85)—A popular technical nphlet explaining and giving details of methods and equipment for measuring the height of level. The practical and scientific importance of such studies and observations, various types fluctuations (tidal, weather and seismic); mean and extreme sea level characteristics, frequency duration; and finally relation of sea level to currents (general circulation currents, wave rents and tidal currents) are treated in separate chapters or sections. Seasonal, monsoonal other local effects connected with weather are given special attention. *Subject Headings:* **Sea level 2. Weather effects on sea level.**—*M.R.*

12M–455 551.461.2:551.555.1

Groves, Gordon W., **Periodic variation of sea level induced by equatorial waves in the terlies.** *Deep-Sea Research*, London, 3(4):248–252, Sept. **1956.** 5 figs., 3 refs. **DLC**— level observations at Canton Island show a regular four-day oscillation which is related to passage of equatorial waves in the easterly winds over the island. Visual sea level observa- ns at Ocean Island show evidence of the same phenomenon. Records from tide gauges situated other nearby islands show no such regular record. This gives an indication of the geographical ent of perturbation of sea level. *Subject Headings:* **1. Sea level variations 2. Prevailing nd effects on sea level 3. Canton Island, Central Pacific Ocean 4. Ocean Island, Central cific Ocean.**—*Author's abstract.*

12M–456 551.556.8:551.465

Hayami, Shoitiro and Kunishi, Hideaki (*both, Geophys. Inst., Kyoto Univ., Japan*), **Spectrum sea level.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of ers.* Issued Wash., D. C., AAAS, **1959.** p. 753–756. 6 figs. In English and German. **VB** (551.46082 I61pr)—Observations made in a wind flume (22 m × 1 m × 0.75 m × 0.5 in er depth) of wind profiles above the water surface, wave forms of the water surface and files of very thin drift current near the surface are briefly reported and graphically illustrated. *bject Heading:* **1. Sea level spectrum.**—*I.S.*

12M–457 551.461.25:31

*Hela, Ilmo, **Sea level records for the years 1887–1896 at Hanko (Hangö) (59°49′N, 58′E).** *Finland. Havsforskningsinstitutet, Merentutkimuslaitoksen Julkaisu,* No. 181, **1958.** p. Mostly tables, 4 refs. **DLC**—This booklet contains tables of sea level records at Hanko, land during 1887–1896. The data consist of 24 daily readings. The figures of maxima and ima are indicated. All the data are given in East European time. *Subject Headings:* **1. level data 2. Hanko, Finland.**—*A.H.K.*

12M–458 551.461.2:525.63

Hishida, Kozo (*Kobe Marine Obs.*), **On the subsidence of ground level at Amagasaki gion, especially with relation to the tidal level.** *Umi to Soro* (*Sea and Sky*), Tokyo, 35

(2/3):65–71, **1959.** 9 figs., table, 4 refs. In Japanese; English summary p. 65. **DLC**—To the phenomena of the subsidence of ground level at Amagasaki, Hyogo Prefecture, lev surveys and observations with subsidence meters were carried out by the Kobe Marine Obser in 1958. In this first report, the author discusses the problem by summarizing the results ob by the levelling survey and then points out the relations between subsidence of ground leve amount of water pumped out and the tidal level changes apart from the mechanism of subsi *Subject Headings:* **1. Tide level variations 2. Ground subsidence 3. Sea level varia 4. Amagasaki, Hyogo, Japan.**—*K.C. and author's abstract.*

12M–459 551

*International Association of Physical Oceanography, **Monthly and annual mean h of sea-level, 1952–1956 and unpublished data for earlier years.** Its *Publication Scient* No. 19, **1958.** 78 p. Almost entirely tables. **DWB**—Monthly and annual mean heights level for more than 350 stations throughout the world are given for 1952–1956 inclusive. ously unpublished data for earlier years provide records for a few stations dating from 1881, etc. *Subject Heading:* **1. Sea level data.—E.***Z.S.*

12M–460 551.461.

§†Johansen, Sverre, **On the effect of meteorological conditions upon the height of t level at the coast of southern Norway.** *Meteorologiske Annaler,* Oslo, 4(14):351–400, 9 figs., 16 refs., 16 eqs. **DLC**—At the southern coast of Norway the meteorological eff sea level height is generally small, but damage to harbors is occasionally experienced, an the problem warrants investigation. The meteorological effect, commonly associated wi passage of depressions, can be gauged by examining crests and troughs ("surges") on co space-time diagrams of sea level observations for several stations. The author investiga laws of propagation of these surges, using hydrodynamical methods. Special analyses are of the effects of wind and pressure. Several synoptic examples are analyzed in detail a amply illustrated with maps for selected days and diagrams of the corresponding sea level data. *Subject Headings:* **1. Sea level measurements 2. Sea level meteorological re ships 3. Norway.**—*R. S. Quiroz.*

12M–461 551.461.2:55

†Jónsson, Jón, **Notes on changes of sea-level on Iceland.** (Ch. 10 of Pt. 3 of Hju Filip; Sundborg, Åke; Arnborgfi Lennart and Jónsson, Jón: **The Hoffellssandur: a glaci wash plain.)** *Geografiska Annaler,* Stockholm, 39(2/3):143–212, **1957.** 38 figs., bibli 210–212. **DLC**—This impressive study on changes of sea level in Iceland includes a rev the literature on ancient shore level in Iceland, of the evidence for the last submerge southwestern Iceland in the Hornafjördur to determine the nature of past rises in sea level samples were taken and the distribution of diatom species and genera was determined. Also tigations were carried out in other parts of Iceland where borings in peat were made bel tephra layer and diatom species and genera were determined. Numerous photographs a grams of sections showing the distribution of diatoms are presented. A supplement contain author's investigations on transgression on northern Iceland carried out in 1957 and a list of species found are included. An examination of diatom flora in submarine peat from s southwestern and northern coasts of Iceland proves that a transgression has taken place times. The transgression comprised with certainty the region from Vestra Horn in the Borgarfjördur in the west. The transgression has been going on for a long time and is ver still unfinished. The amount of transgression during the last thousand years is estimated at cm per yr. *Subject Headings:* **1. Sea level variations 2. Iceland.**—*I.L.D.*

12M–462 551.515:5

†Kajiura, Kinjiro, **Theoretical and empirical study of storm induced water level and** Texas. Agricultural and Mechanical College. Dept. of Oceanography and Meteorolog tract Cwb-9559, Final Technical Report, Dec. **1959.** 97 p. 26 figs., 2 tables, 43 refs., 77 eqs. in appendices. **DWB** (M(051)T355tec)—General discussion on the nature, chara and physical factors affecting storm surges. Dynamical methods of storm surge predic reviewed. Pt. I includes an analytical presentation of the variation of water level in infinite nonrotating sea of constant depth; while Pt. II gives the results of studies made o surges, hurricanes and extra-tropical storms. Studies of the water level variation al Atlantic coast indicate that Atlantic City has a correlation coefficient of 0.96 with Sand as well as a correlating regression factor of 0.9 while New London and Sandy Hook have them a coefficient of 0.96 with the regression factor of 0.7. *Subject Headings:* **1. Stor effects on sea level 2. Sea level variations 3. New Jersey. Atlantic Coast.**—*N.N.*

12M–463 551.543:551.461.2(262)

Kasumovic, Marijan, **O utjecaju tlaka zraka i vjetra na kolebanje razine jadrana.** [On the influence of pressure and wind on fluctuations of sea level.] *Zagreb. Sveučilište. Geofizički Institut, Radovi (Papers), Ser. 3,* No. 10:107–121, **1958.** 3 graphs, 4 tables, 6 refs., 6 eqs. German summary p. 120–121. **DWB, DLC**—The influence of slow changes of pressure on the oscillations of the mean water level of the northern Adriatic is investigated. The empirical reduction factor was obtained by comparison of the mean water level at Bakar with changes of pressure at Kraljevica. The annual maximum and minimum are due to the cyclonic and anticyclonic conditions of the atmosphere. The decline of pressure and the sirocco wind causes a damming up of water level. Extremely low water level occurs during anticyclones characterized by high pressure and calm only, the pressure being the solitary factor. Diagrams illustrate the hourly amounts of mean water level and pressure in three selected samples. The monthly mean maxima and minima of water level at the harbors of Venice, Ancona, Viesti and Bacar are presented in tables. *Subject Headings:* **1. Pressure effects on sea level 2. Sea level variations 3. Adriatic Sea.**—*O.T.*

12M–464 551.511:551.461.2(262)

†Kasumovic, Marijan, **Dinamički utjecaj atmosfere na kolebanje razine jadranskog mora.** [Dynamic influence of the atmosphere on level variations of the Adriatic Sea.] *Zagreb. Sveučilište. Geofizički Institut, Radovi (Papers), Ser. 3,* No. 11, **1959.** 48 p. numerous figs., tables, 25 refs., numerous eqs. German summary 6. 44–48. **DWB, DLC**—A theoretical explanation of the twelve-hour periodic oscillations as a static wave with a bolly at the northern end of the gulf and another one at the Gargano Peninsula, is attempted. Apply G. CHRYSTAL'S method, an analytical expression for the normal course is derived. The corresponding results of empirical and theoretical investigations make it probable that they represent a free swing in the Adriatic confined by a south barrier from the Gorgano Peninsula and the island-group, swinging the water-mass like in a lake. The narrowing of the basin by this barrier and the sudden decline of the depth can be considered as the cause of water-updam. *Subject Headings:* **1. Atmospheric effects on sea level 2. Sea level variations 3. Adriatic Sea.**—*O.T.*

12M–465 551.461.2:525.63

Kukkamäki, T. J., **Korkeusmittausten lähtökorkeus.** [The reference surface of the elevations.] *Terra,* Helsinki, 68(4): 112–123, **1956.** 7 figs. English summary p. 123. **DLC**—The physical sea level is the most common reference surface for elevation measurements. It is affected by several temporal changes, as tide, wind, atmospheric pressure, currents, eustatic change, and by several local changes, as salinity, temperature, wind, currents, tide waves. Due to the local differences the reference elevations in different countries are different. The adjusting of these differences between European levelling nets is going on. The actual shape of the mean sea level is not a regular ellipsoid but a geoid which deviates from the ellipsoid some dozens of meters. The elevation marks, fasten at the earth's crust, move with the movements of the earth's crust. The Fennoscandian land uplift is shown in a figure and the change of the shore line in another. In Finland the present elevation values give the elevations for the beginning of 1943 above the mean sea level at Helsinki. *Subject Headings:* **1. Mean datum 2. Sea level 3. Finland.**—*Author's abstract.*

12M–466 551.543:551.556.8:551.461.2:551.468.2

*Lisitzin, Eugenie, **Annual variation of the slope of the water surface in the Gulf of Bothnia.** *Finska Vetenskaps-Societeten, Helsinki, Commentationes Physico-Mathematicae,* 22(6), **1957.** 19 p. 5 figs., 18 tables, 10 refs. **DWB, DLC**—Previous work on determining the slope of the water surface in the Baltic is referred to. Data tables are provided for the average values of the annual variation of the slopes of the water with reference to the upper 20 m, differences in water level, regional distribution of water height differences, monthly air pressure differences, influences of wind forces, and other geographic factors about the area of the Gulf of Bothnia. *Subject Headings:* **1. Water surface slope 2. Ocean-atmosphere interaction 3. Gulf of Bothnia.**—*N.N.*

12M–467 551.461.2:551.5

*Lisitzin, Eugenie, **Contribution to the knowledge of the range of sea level variations in the North Baltic.** *Finland. Havsforskningsinstitutet, Merentutkimuslaitoksen Julkaisu,* No. 153, **1952.** 20 p. 17 tables, 6 refs.—The study is mainly concerned with the extreme sea level differences which can occur at selected stations along the Finnish coasts within an hour, a day, a month, a year, or an entire period of observations. The annual course of these variations is given and some meteorological causes are briefly discussed. *Subject Headings:* **1. Sea level variations 2. Finland 3. North Baltic Sea.**—*A.A.*

12M–468 551.46

Lisitzin, Eugénie (*Institut Finlandais pour l'Exploration de la Mer*), **Problèmes liés** **études du niveau de la mer.** [Problems related to the studies of sea level.] *France. Com* *Central d'Océanographie et d'Etudes des Côtes, Cahiers Océanographiques,* 11(8):585–591, Se Oct. **1959.** 2 tables, 7 refs. **DLC, DWB**—A discussion of the extensive and diverse probl related to the studies of sea level and its variations under three principal groupings: 1. problems based on the monthly averages of sea level. 2. Problems linked to regular phenom 3. Problems linked to phenomena of a more or less accidental nature. The discussion of th problems is illustrated by examples based principally on the author's studies in the area of Baltic Sea. Velocities of the current in the Kvark, determined by two different methods tabulated. A tabulation of the difference in level between Kemi and Segerby is also presen *Subject Headings:* **1. Sea level data 2. Sea level variations 3. Baltic Sea.**—*I.S.*

12M–469 551.4

Lisitzin, Eugenie (*Helsinki, Finland*), **Contribution to the knowledge of the annual c** **of sea level.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstr* *of papers.* Issued Wash., D. C., AAAS, **1959.** p. 767–768. table. French summary p. **DWB** (551.46082 I61pr)—The average residues of annual sea level variations after the elim tion of air pressure and thermal density for six station groups in the Northern Subtropical of the Atlantic and for five station groups in the adjacent subpolar region are presented in tab form and their importance for the study of the annual cycle of sea level is discussed. *Sub* *Headings:* **1. Sea level variations 2. Atlantic Ocean.**—*I.S.*

12M–470 551.583.3:551.461.2(26

†L'vov, V. P., **Kolebaniia urovnia Aral'skogo moria za poslednie 100 let.** [Fluctuation the Aral Sea level in the past 100 years.] *Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Inst* *Trudy,* No. 46:80–114, **1959.** 11 figs., 2 tables, 36 refs. Russian summary p. 113. **DW** The level of the Aral Sea was investigated for the period 1874–1911 (i.e., for the period prece systematic observation on the level of this sea) and the variation from 1911–1957. The cont of this comprehensive study are as follows: the history of observations of water level of Aral Sea, analysis of long period series of observations on sea level at Aral'sk and Ak-Tums position of contemporary (1911– 1957) levels in the secular variation of the level of the Aral evidence of low level of the sea in the nineteenth century; evidence of a sudden rise in leve the Aral Sea in the early years of this century; more accurate evidence on the height of the of the Aral Sea for the period since 1874; curve of variations of level during 1874–1957; problem of height of the level of the Aral Sea in prehistoric time, bench marks on the shore the Aral Sea. The results of the study indicate the following: the level of the Aral Sea sh secular fluctuations of different period and amplitudes during the past 100 years; periods several thousand years showed a fluctuation level with an amplitude of 6 m and more; the fluc tions during the past 100 years varied within the limits of 3 m. At the end of the ninete century the level was below the secular normal. Between 1906 and 1907 the level was 3 m a the level of the 1880's. The contemporary elevated level cannot be considered stable. A varia in the volume of the mass of water of the Aral Sea and in the area of its surface occurs du the fluctuation of the level of the sea. *Subject Headings:* **1. Sea level variations 2. Aral** —*Author's abstract and I.L.D.*

12M–471 551.466.7:551.461.2:532

Maksimov, I. V. (*Leningrad*), **The long-period fluctuations in mean sea level.** *Inte* *tional Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued W D. C., AAAS, **1959.** p. 768–770. table. In English and Russian. **DWB** (551.46082 I61p The long-period fluctuations of mean sea level are produced by the interaction of the semimo and monthly tidal waves, the semiannual solar tidal wave, the 14-month nutational wave of "polar tide" and 19-year wave of lunar declinational tide. The conclusions drawn from a s of these waves on the basis of world observations of sea level fluctuations are briefly rep Latitudinal variations of the amplitudes of the primary long-period tide waves are present tabular form. *Subject Headings:* **1. Sea level variations 2. Tidal wave effects on sea l** —*I.S.*

12M–472 551.24:551.461.2(

†Ma, Ting Ying H., **Cause of change in sea level in the Western Pacific.** (Vol. 4, of his **Oceanographia Sinica**) issued Taipei, Taiwan, China, Oct. **1957.** 6 p. fig., 35 **DWB** (P)—From practical observations, it has been found that the coastal regions of Ea Asia and islands scattered on the geanticlinal ridges in the Western Pacific have continue

Tidal gage records show that the coastal regions are rising at a rate of 17 cm per century. ı regions are all on the forward edges of crustal masses shifted during the disastrophism due ıe last sudden total displacement of the solid earth shell, and the shear zone of the overthrust e is a weak zone over which there is gradual movement of the upper wing, due to the rotation he earth, as represented by earthquake foci to a depth of 700 km. Although the movement ery small the amount of gradual uplift due to the angle of the overthrust plane effects the ive sea level to an amount considerable as compared to what may be attributed to a decrease ea water due to eustatic movement. *Subject Headings:* **1. Sea level changes 2. Crustal ft 3. Western Pacific.**—*Author's abstract.*

12M–473 551.5 :551.466.78 :551.461.2(261.3) :551.468.1

Markova, L. L., **Sgonno-nagonnye kolebaniia urovnia v iugovostochnoĭ chasti Baltiĭskogo ia i v zalivakh—Kaliningradskom i Kurshskom.** [Ebb and flood tide variations in the in the southeastern part of the Baltic Sea and in the Kaliningrad and Kurshsk Gulfs.] *uvos TSR Mokslu Akademija. Geologijos ir Geografijos Institutas, Moksliniai Pranešimai,* 3, issued Vilna, **1956.** p. 137–140. 3 figs.—In view of the fact that ebb and flood tide es more than 1 m rise in water level the character of the periodic fluctuation of level is stigated as a function of synoptic conditions. Ebb and tide flow was studied along the south-ern coasts of the Baltic Sea where the mean sea level computed from 40 years of observations stations, namely Liepsia, Klaipeda, Stockholm, etc. An analysis of the effects of ebb and flow indicated 5 most characteristic instances, namely: (1) tide over the entire sea, in the ence of strong winterly and southwesterly winds, under whose action water from the North arrives into the Baltic Sea through the Danish Straits. In addition the maximum level is ned at the Swedish coast 1–12 hours before the southeast coasts; (2) tide at the southeast ts is small (20–30 cm) also at the coasts of Sweden during intense north-west and north ls; at the southeast coast these have an average magnitude and are observed rarely; (3) ebb the entire sea in the case of protracted and intense winds; the level falls gradually but not e than 40 cm; (4) ebb at the southeast coast and the tide at the coast of Sweden are slight ng local ebb causing at winds—easterly and southeasterly—there may be observed in this on a rise in sea level of 40–70 cm associated with storms and flood in the North Sea. The cal synoptic conditions during which intense southerly winds occur is the location of the rear cyclone over the Baltic Sea. The influence of the geographic position upon the surface level ulfs and the character of ebb tide in the various gulfs are discussed. *Subject Headings:* **1. al variations 2. Synoptic conditions for tidal variations 3. North Sea 4. Baltic Sea.** *L.D.*

12M–474 551.35.06(521.41) :525.6 :551.461.2

Nakada, Y., **On the rising of the sea level at the Niigata Port.** *Journal of Meteorological earch,* Tokyo, 11(2) :149–152, Feb. **1959.** fig., table, ref., 4 eqs. In Japanese. **DWB**—Using records obtained by the Niigata Port Office during sea level investigations from 1951–1958, author calculated the mean monthly tidal range. Periodic and nonperiodic variations are ted out and discussed. It is concluded that from May 1950–Feb. 1958 there was a total sub-nce of 88.4 cm. *Subject Headings:* **1. Sea level variations 2. Tidal ranges 3. Niigata, an.**—*E.Z.S.*

12M–475 551.35.061(521.41) :525.6 :551.244 :551.461.2

Nakada, Y., **On the rising of sea level at the Niigata Port, Pt. 2, In relation to the sinking round surface in Niigata District.** *Journal of Meteorological Research,* Tokyo, 11(7) :650– July **1959.** 2 figs., 2 tables, 2 refs., 3 eqs. In Japanese. **DWB, DLC**—A figure of the iding ground surface in Niigata District (April 2, 1959) shows the distribution of mean sidence for 8 months (Feb.–Oct. 1958), and the subsidence for 4 months (Oct. 1958–Feb.) in the vicinity of the Shinano and Agano rivers. The results obtained show the subsidence 1.4 mm day^{-1} at the center of the district, about 45 mm in a month and 54 cm in a year in district as a whole. A second figure suggests the rising of sea level at Niigata port. It udes both observed and computed values from 1953 to 1963. It is suggested that the rising ea level will increase in the future. *Subject Headings:* **1. Sea level variations 2. Niigata fecture, Japan.**—*K.C.*

12M–476 551.506.22 :551.461.22

Pattullo, June G. (*Scripps Inst., La Jolla, Calif.*), **The seasonal variation in sea level at ific Islands during the IGY.** *International Oceanographic Congress, 1st, N. Y., 1959, Pre-ts of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 778–780. French sum-y p. 779–780. **DWB** (551.46082 I61pr)—Seasonal variations in sea level at Pacific Islands based on the IGY measurements are described and compared with those previously pub These measurements confirm the earlier descriptions and give some new information. It i gested that two principal and one secondary mechanisms explain the observed results. S *Headings:* **1. Sea level variations 2. Pacific Islands.**—*I.S.*

12M–477 551.461.2

Prasada Rao, R. and La Fond, E. C., **Changes in sea level at Visakhapatnam on th coast of India.** *Andhra Univ., Waltair, India, Memoirs in Oceanography,* 1:86–93, **1954.** table, 13 refs. **DLC** (GC1.A55)—The annual mean variation of the sea level shows sonally conditioned variation of about two feet during Jan.–Oct. The latter may be exp by vertical distribution of density of sea water accounting for 90% and atmospheric pr variation for the larger part of 10% since rainfall, drainage, wind speed and directio accountable although small. *Subject Headings:* **1. Sea level variations 2. Visakhapa India.**—*W.N.*

12M–478 551.461.2:551

*Preobrazhenskiĭ, Iu. V. and Remezova, M. V., **Privedie urovneĭ moria k edinomu posta s iskliucheniem ikh vekovykh izmeneniĭ.** [Reduction of sea leavels to a common a station, with the exception of their secular variations.] *Moscow. Gosudarstvennyĭ O graficheskiĭ Institut, Trudy,* No. 37:94–154, **1959.** 20 figs., 13 tables, 24 refs., 44 eqs. E summary p. 153–154. **DWB**—The variations in sea level at different periods due to astron meteorological and hydrological factors are classified as: short range (tides, seiches, etc.), range (monthly, seasonal and annual) and secular variations. The studies of long range tions, listed in the given references, are reviewed and graphic and mathematical analys given. Systematic observations are considered essential for various geodesic problems analysis of the dynamics of sea water, harbor hydro-engineering installations and in the p tion of detailed navigational maps. All observations on sea level variations are referred common zero mark made on land which are located in relation to the bench marks "reper" government system of levelling. The grapho-analytical method of comparison of different ties of sea level variations reduced to common zero is broadly discussed in this review. At is given to the indication and correction of errors, to determination of the secular variatio exclusion of their influence in the reduction of averages of long range sea levels to a c year. In addition to the description of the method of analysis of observations from a c zero point the solution of the corresponding equations are made by the least square method use of these methods is discussed in relation to other problems, including that of outlin equipotential surfaces in the open sea areas, used in preparing navigational maps of differ regions. A special chapter is assigned for practical recommendations on the control of o tions of levels and also for their evaluations. The data on the annual averages of lev their differences and on other relations are tabulated and graphically illustrated. *Subject ing:* **1. Sea level variations.**—*N.P.S.*

12M–479 551.461.2:5

Reid, R. O., **Approximate response of water level on a sloping shelf to a wind fetch moves towards shore.** *U. S. Corps of Engineers, Technical Memorandum,* No. 8, Jun 47 p. 22 figs., 3 tables, 6 refs., 80 eqs. **DWB.** Reprinted as *Texas. A. and M. College. of Oceanography and Meteorology, Contributions in Oceanography and Meteorology,* 3(73–127, 1955–1957. Issued **1958. DWB**—The report describes a procedure for eva the approximate response characteristics of water level at the shore of a sloping shelf d wind fetch moving directly onshore. The theory is based upon the linear one-dimension equation and employs the method of characteristics as a means of solution by graphical te A total of about 55 fetch length and storm speed were investigated numerically, and the results are summarized in graphical and tabular form. *Subject Headings:* **1. Sea leve tions 2. Wind effects on sea level.**—*Author's abstract.*

12M–480 551.242:5

†Saxov, Svend (*Geodetic Inst., Copenhagen*), **Old water marks in Bornholm.** *Geo Annaler,* Stockholm, 41(4):256–260, **1959.** fig., 3 tables, 12 refs. **DLC**—A compilation from Fennoscandia, Denmark and Bornholm on old water marks as indicators of chang level. Three tables summarize the data collected around the Baltic sea including part of A map indicates the suggested concept of vertical movement of the earth's crust in rel normal sea level. The data suggest that most probably no change or at most a very sligh has occurred in Bornholm during the last 70–100 years. But no account has been taken eustatic variation, the atmospheric influence of sea level, the fluctuating intensity of th

rtical land movement, sediment changes in the Baltic Sea bottom, or subcrustal changes in the ıltic Sea. Judging from the long-period readings from the Stockholm Lock gage, the influences om these factors on the change-of-level coefficients are only small. *Subject Headings:* **1. Sea** **vel changes 2. Earth's crustal movements 3. Baltic Sea.**—*E.Z.S.*

MEASUREMENTS, TECHNIQUES AND INSTRUMENTS

12M–481 525.6:551.46.08:551.46.062.1

Shenderovich, I. M., **Nekotorye rezul'taty morskikh ispytaniĭ mareografov otkrytogo** **oria (MOM).** [Certain results of tests on open sea (MOM).] *Leningrad. Nauchno-Issledo-tel'skiĭ Institut Gidrometeorologicheskogo Priborostroeniia, Trudy,* No. **7**:147–154, **1959.** 5 figs., tables, ref., 5 eqs. **DWB**—Experiments were carried out with a series of open sea mareographs the type MOM No. 1 and No. 2 in order to determine the accuracy of sea level when the struments are set up at different depths (12, 60 and 100 m). A shore mareograph and a easuring rod were used as controls of the level measurers; in those localities where these were cking the measurements of the open sea were compared against one another. While the record-gs of the mareographs in the case of simultaneous installation did not differ among themselves ey were lower as compared with recordings of the shore installation. The fundamental cause this lower sounding of the mareographs is explained by the fact that the effect of pressure om the variations of the volume of the pressure unit of the instrument was not taken into count. On the basis of Boyle's law, a formula is derived showing that in the compression of e pressure unit there is an increase in the magnitude of atmospheric counter pressure in the pth unit which depends both on the depth of submergence of the instrument and the amount pressure change. The correction is given by the formula $\Delta H(\mathrm{cm}) = 0.02356 H_0(M) \Delta\rho(\mathrm{mm})$, here $\Delta H =$ level correstion, $H_0 =$ depth of the apparatus. The author presents the analysis a mareograph tape. *Subject Headings:* **1. Sea level measurements 2. Mareographs.**—*I.L.D.*

12M–482 551.465:551.461.2

Shoji, Daitaro (*Japanese Hydrographic Office, Tokyo*), **On the variation of daily mean sea** **vels and the Kuroshio from 1954 to 1955.** (In: UNESCO Symposium on Physical Oceanog-phy, Tokyo, Oct. 1955, **Proceedings,** pub. **1957.** p. 130–136. 4 figs., 5 refs. French summary 130. **DWB**—The change of density of sea water causes the elevation or lowering of water vels. There is a correspondence between sea level and the position of the Kuroshio current. *ubject Headings:* **1. Sea level variations 2. Kuroshio Current 3. Western Pacific Ocean.**— *.Z.S.*

12M–483 523.746:551.461.24(262.8)

Soskin, I. M., **Uroven' Kaspiia i solnechnaia aktivnost'.** [The Caspian sea level and solar tivity.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy,* No. **89**:73–82, **1959.** 7 gs., 11 refs. **DLC**—The author examines the secular and 11-year cyclical fluctuations of the vel of the Caspian Sea and of solar activity. The fundamental fluctuations of the Caspian Sea vel are secular. They constitute the background upon which cyclical fluctuations of minimum eriod are superimposed. The characteristics of solar effects are determined on the basis of lative sunspot number-Wolf number. The relationship between secular fluctuations of sea level d solar activity are studied by means of integral curves. It is demonstrated that the relation-ip is clearly expressed and has an opposite sign. The latter signifies that during periods of duced solar activity the mean level of the Caspian Sea is above the normal and during intensified lar activity the mean level of the Caspian Sea is below the mean secular position. The relation-ip is direct and is established through the atmospheric circulation. By means of this relationship d a very long range forecast of solar activity (1975) the author projects a probable secular uctuation of sea level for the nearest 10–15 years. It is expected that the sixties will be critical r the fluctuations of the level of the Caspian Sea. In this decade the process of long depression ould be discontinued and a general rise should become clearly evident. No sufficiently close lationship could be established between the 11-year cycle of fluctuation of sea level and the nalogous fluctuations of solar activity. *Subject Headings:* **1. Sea level-solar activity relation-hip 2. Caspian Sea.**—*Transl. of author's abstract* (*I.L.D.*)

12M–484 551.463.6:551.526.6:551.461.2

*Stewart, H. B., Jr.; Zetler, B. D. and Taylor, C. B. (*all, U. S. Coast and Geodetic Survey*), **ecent increases in coastal water temperature and sea level—California to Alaska.** *U. S. oast and Geodetic Survey, Technical Bulletin* No. 3, May **1958.** 11 p. 6 figs., 5 tables. **WB** (551.46 U582re)—Increases in coastal water temperature and sea level in the area that xtends from California to Alaska have been noted in recent years by the U. S. Coast and eodetic Survey. Monthly records from Los Angeles, La Jolla, Santa Monica, San Francisco,

Crescent City (all of California) and Sitka, Alaska have been analyzed in this report. The
and the results are for the period January 1957–March 1958. *Subject Headings:* **1. Coa**
water temperatures 2. Sea level data 3. Sea level variations 4. West Coast, United Sta
—*N.N.*

12M–485 551.461.2:551
Tsumura, Kenshirô (*Kyoto Univ.*), **Study of change in the difference of monthly**
daily mean sea-levels between two stations, as an indicator of the vertical crustal defor
tion. *Seismological Society of Japan, Tokyo, Journal* (Zisin), Ser. 2, 10(2):67–78, Oct. 1
8 figs., 11 refs. In Japanese; English summary p. 67.—The Japanese coast, on both the Pa
and Japan Sea sides, can be divided into several regions, in each of which the monthly m
sea-levels at mareograph stations change almost identically. One of the most remarkable bou
ries between such regions is located near the southern end of Kii-Peninsula, Honshu. If
stations are situated in the same one of such regions as above mentioned, the change in the di
ence of monthly mean sea-levels between those stations may more conveniently be used for st
ing the vertical crustal deformation at the place than that in the monthly mean sea-levels, th
selves, because the former is less irregularly disturbed by meteorological and oceanograph
effects. The change in the difference of daily mean sea-levels between selected stations can
be used for tracing the detailed process of vertical crustal deformations. By these procedu
the vertical crustal deformations before and after destructive earthquakes have been investig
The results obtained are shown in figures. *Subject Headings:* **1. Sea level variations 2. Cru**
deformation measurement 3. Japan.—*Author's summary.*

12M–486 551.543:551.4
Unoki, Sanae, **On the variation of sea level caused by the variation of atmospheric p**
sure. *Oceanographical Magazine,* Tokyo, 2(1):1–15, March 1950. 6 figs., 3 tables, 5 refs.
eqs. **DWB**—Author calculates the retardation of the oscillation of sea level due to a mo
wave of barometric pressure assuming resistance proportional to velocity of fluid particles.
retardation increases with length and speed of surface pressure oscillation, decreases with
creasing depth of ocean and increases with latitude; alignment of coast is also effective.
cases are discussed in which the observed retardation was 4.2 and 1.5 hrs compared with
culated values of 6.5 and 2.2. Effect of wind is not considered. (*Same item as* 2.4-106, A
1951, *Met. Abs.*) *Subject Headings:* **1. Oceanography 2. Sea level variations 3. Atmosph**
tides 4. Japan.—*C.E.P.B.*

12M–487 551.556.8:551.4
Unoki, Sanae, **On the upheaving effect of the stationary and non-stationary winds u**
the sea level. [An investigation on meteorological tides in the neighboring seas of Japan—
paper.] *Meteorological Society of Japan, Journal,* 2nd Ser., 29(5):147–162, May **1951.** 4
6 refs., 74 eqs. In Japanese; English summary p. 161–162. **DWB**—A mathematical discu
of the effect of fetch, depth, wind gradient and latitude on the slope of the water surface
canal and a semi-infinite ocean. *Subject Headings:* **1. Wind effects on sea level 2. Sea**
variations.—*C.E.P.B.*

12M–488 551.461.2:
Unoki, Sanae (*Met. Res. Inst., Tokyo*), **An investigation on meterological tides in**
neighboring seas of Japan, Pt. 4, General features of regional distribution and seas
variation. *Oceanographical Magazine,* Tokyo, 11(1):51–63, Aug. 1959. 5 figs., 5 tables, 5
DWB, DLC—The purpose of this paper is to describe statistically the features of regional
tribution and seasonal variation of meteorological tides on various coasts of Japan because
knowledge of them is very fragmentary in comparison with that of astronomical tides.
measure representing the characteristic strength of meteorological tides, the maximums of pos
and negative anomalies of sea level in each month are used. *Subject Headings:* **1. Meteorolo**
tides 2. Sea level anomalies—*Author's abstract.*

12M–489 551.461.2:
Vladimirov, O. A., **Prosteĭshiĭ put' vychisleniia naimen'shego i naibol'shego teoretiches**
urovneĭ moria po garmonicheskim postoiannym metodom naimen'shikh kvadratov. [Si
method of calculating the minimum and maximum theoretical sea level by harmonic constants
the method of least squares.] *Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Institut, Trudy,*
46: 73–79, **1959.** fig., 4 tables (1 fold.), 2 refs., 2 eqs. Russian summary p. 79. **DWB**—The au
presents a very simple method for calculating the minimum and maximum sea levels by usin
least square method. The results obtained are slightly different from the values resulting from

ore complicated method of N. P. VLADIMIRSKIĬ (**Rukovodstvo po obzabotke i predskozaniiu ilivov, 1941**). The height of the sea level is shown to be given by the equation:

$$h_i = f_{m_2} H_{m_2} \cos\varphi_{m_2} + \cdots f_{Q_1} H_{Q_1} \cos\varphi_{Q_1},$$

here f = reduction multiplier, H = semi amplitude of wave components and φ = the term for the ngular velocity of the component waves multiplied by the mean number of hours from zero hours us the initial astronomical data for zero hours on Jan. 1 on the Greenwich meridian minus the ngles of position of these waves on zonal time, i.e. $[q_{m_i}{}^t + (V_0 + u)_{m_i} - q_{m_2}{}^0]$. The equation for lculating φ_{m_2}, tables giving values of reduction coefficient f, harmonic constants and the reduction ultiplier for N = 180° (mouth of the Chizha River) and the results of computations of minimum nd maximum levels are presented. The method was found to give good results with a confidence 96%. *Subject Heading:* **1. Sea level calculations.**—*I.L.D.*

12M–490 551.48:551.~~21~~:551.461.2(522.7)

Yasui, Y. and Tanabe, T., **On the variation of water level of a well at the coast of akurajima Island accompanying the sea tide.** *Journal of Meteorological Research*, Tokyo,)(2):123–127, Feb. **1958.** 5 figs., 3 tables, ref. In Japanese. **DWB, DLC**—For the discovery symptomatic phenomenon before eruptions start, periodic observations of the temperature of ell water were made in 1957 on the presumption that an eruption causes an elevation of water vels. It was found that the well level was not dependent upon ascending water, but upon a idden earthquake which disturbed an area of ground water. At this particular well, the difference between tidal and well variations was not similar to the phenomenon of 'chinetsu conduction'; e farther from the coast, the lesser the range of water level. It is concluded that the particular enomenon must occur in an earth structure of an eruption zone around the Gulf of Kinko near akurajima. *Subject Headings:* **1. Water level in wells 2. Hydrological studies 3. Sakurama Island, Japan.**—*K. C.*

12M–491 551.543:551.556.8:551.461.2

Zubov, N. N. (*Chair., Oceanology, Moscow State Univ.*), **The influence of baric relief on a level and currents.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of stracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 792–796. fig., eq. In English and ussian. **DWB** (551.46082 I61pr)—Directly and through the action of wind and currents generated by the wind the atmospheric pressure influences sea level. In this paper the direct and direct atmospheric pressure on sea level is described by employing the Margules-Bjerknes equaon for the surface slope of the discontinuity between two fluids. *Subject Headings:* **1. Sea level ariations 2. Pressure effects on sea level.**—*I.S.*

METEOROLOGICAL OCEANOGRAPHY

GENERAL

See also: **Meteorology** (Benua), 12M–2; **Handbook of navigation** (Müller), 12M–74; **Meteorological navigation** (Frankcom), 12M–79; **Capricorn Expedition** (California), 12M–115; **Soviet scientists in the Arctic** (Burkhanov), 12M–126; **Wave forecasting for Gulf of Mexico** (Bretschneider) 12M–368; **Surge frequencies** (Lundbak), 12M–388; **Storm tides, coast of Japan** (Okuyama), 12M–391; **High-water problems, Danish Coast** (Ringe-Jørgensen), 12M–395; **Coastal regime, Ivory Coast** (Varlet), 12M–402; **Level of world oceans** (Duvanin), 12M–453; **Sea level** (Duvanin), 12M–454; **Sea level, coast of Norway** (Johansen), 12M–460; **Storm induced water level anomalies** (Kajiura), 12M–462; **Fluctuations of sea level** (Kasumovic), 12M–463.

12M–492 551.574.1:551.463

†Blanchard, D. C. and Woodcock, Allan H. (*Woods Hole Oceanog. Inst.*), **Bubble formation nd modification in the sea and its meteorological significance.** *Tellus*, Stockholm, 9(2): 45–158, May **1957.** 9 figs., table, 37 refs., 11 eqs. **DLC**—It is believed that the vast majority f the airborne salt nuclei arise from bursting bubbles at the air—sea water interface. Four atural mechanisms for the production of these bubbles have been studied. These are whitecaps, ain, snow and supersaturation of the surface waters of the sea due to spring warming. The ubble spectra from whitecaps and snow flakes have been measured and semiquantitative and ualitative observations have been made on the bubble spectrum produced by raindrops. No vidence of bubble production by spring warming has been obtained. All of the measurements

show that a majority of the bubbles are < 200 microns diameter and, in the case of bubbles fro snowflakes, < 50 microns. In the vicinity of a breaking wave the bubble production rate is abo 30 cm^{-2} sec^{-1}. Due to the effects of surface tension in increasing the bubble internal pressu all bubbles < 300 microns will go into solution even at sea water air saturation of 102%. Bubbl < 20 microns will go into solution at saturations up to 115%! The solution time for sma bubbles of about 10 microns is about 10 sec and is not markedly affected by the water saturatic percentage. It is concluded that the effects of the rate of solution of bubbles in sea water ca under some conditions, play a significant role in modifying the initial bubble spectrum. This, i turn, should influence the spectrum of airborne nuclei. *Subject Headings:* **1. Bubble formatio 2. Saline nuclei origin 3. Bursting bubbles.**—*Authors' abstract.*

12M–493 551.5:551.4

Carruthers, J. N., **Outline of oceanography.** (In: Great Britain. Meteorological Offic **Meteorology for mariners.** pub. **1957.** p. 219–267. (i.e., ch. 19–25) figs., refs.) **DW** Reprinted in *National Institute of Oceanography, Wormley, Surrey, England, Collected Reprint* Vol. 5, No. 163, **1957. DWB**—The scope of oceanography as a science and its close relationsh with meteorology and other diciplines are explained. Pertinent chapters are respectively: physic and chemical characteristics of sea water, topography of ocean bottoms, nature of ocean bottom insolation and light penetration, marine biology, research vessels and oceanographical observation variation of temperature and salinity with depth. *Subject Headings:* **1. Oceanography Marine meteorology.**—*W.N.*

12M–494 551.58(261):551.

†Chase, Joseph (*Woods Hole Oceanog. Inst.*), **Oceanic climatology—North Atlantic.** (I Woods Hole Oceanographic Institution, Woods Hole, Mass., **Environmental factors influenci the performance of naval weapon systems.** Woods Hole, **1959.** p. 45–52. 8 figs., tabl **DWB** (M:623.4 W894en)—Since the North Atlantic Ocean exhibits most of the meteorologic features found in other oceans it is selected as a model for the study of oceanic climatology. T climate of the North Atlantic Ocean is explained by taking into consideration the general circul tion features, the temperatures of the sea surface, and of the air above it, and the continent influences. The paper is extensively illustrated. A list of selected titles of climatic atlases a books is given. *Subject Headings:* **1. Oceanic climatology 2. North Atlantic Ocean.**—*I.*

12M–495 551.513.1:551.465(266/26

†Curry, Leslie (*Univ. of Maryland*) and Armstrong, R. W., **Atmospheric circulation of t tropical Pacific Ocean.** *Geografiska Annaler,* Stockholm, 41(4):245–255, **1959.** 10 figs., foot-refs. **DLC**—The object of this study was to provide a genetic description of the weath of the various parts of the tropical south Pacific area. This is a regional essay, not a rigoro analysis. The data are admittedly inadequate to provide a precise treatment. The areas referr to are: the Indian Ocean, the eastern regions, the central Pacific, the eastern North Pacific t southern boundary zone, Northern Australia, the Samoa region, New Guinea area and the Unit States trust territory. Author's conclusion: "The climatology of the tropical Central and Sou Pacific Ocean is remarkable because of the sharp gradients which occur and the complex patte resulting in spite of the absence of relief features. This contrasts with the higher latitudes the South Pacific where genetic processes are little differentiated. As in this latter area t airmass concept has been seen to have little or no value. Discussion in terms of trade win monsoons, and their zones of meeting have proved unfruitful. It is only by appeal to the ba upper air streams and their perturbations that a logical and consistent description can be ma The next step in the world classification of climate on a genetic basis would seem to lie in similar direction." *Subject Headings:* **1. Atmospheric circulation 2. Tropical Pacific Oce** —*Authors' conclusion and E.Z.S.*

12M–496 551.511:551.513.1:551.543.3:551.

Isaev, E. A., **Osnovnye kharakteristiki baricheskago rel'efa nad Atlanticheskim Okean i Evrazieĭ** [Basic characteristics of the barometric contours over the Atlantic Ocean and Eurasi Leningrad, Gidrometeoizdat, **1956.** 45 p. 13 figs., tables, 4 refs. At head of t-p.: Glavn Geofizicheskaia Observatoriia. **DWB** (M43.3 I74os)—The variability of pressure relief o the Atlantic Ocean and Eurasia was determined by calculating the number of days with differ pressure systems over Eurasia and the adjacent part of the Atlantic and Pacific Ocean for ea month. The map was divided into 10° squares and for each square there was computed frequency of pressure relief subdivided into cyclones, ridges, anticyclone peripheries and troug Cyclones and anticyclones were represented by pressure structures having a closed central isol and the ridges and troughs by a system of U-shaped isobars with a clearly marked axis or fr outlined by at least two isobars. Synoptic maps for the period 1898–1938 and material on ca each type of pressure relief served as the initial data for constructing maps of frequency of ssure relief. The data obtained were transferred to map and then analyzed with the aid of ines of frequencies of pressure systems. The resulting maps of frequencies of cyclones and icyclones, and tables with mean number of days of pressure systems are analyzed. Maps show- the long period frequency of anticyclones and cyclones for each month, the long period mean nthly pressure for each month and numerical data on the frequency of cyclones in regions of ters of atmospheric activity, frequency of cyclonicity and anticyclonicity and frequency of lones, of ridges of periphery of anticyclones, of cyclones, of cyclonic troughs, of number of s of peripheries of cyclones (in days) are presented. *Subject Headings:* **1. Barometric con- rs over Atlantic Ocean 2. Barometric contours over Eurasia.**—*I.L.D.*

12M–497 551.594.11(26):551.46

Lobodin, T. V., **Nekotorye rezul'taty issledovaniĭ elektricheskogo polia nad okeanami.** ertain results of investigations on the electric field over oceans.] *Leningrad. Glavnaia Geo- cheskaia Observatoriia, Trudy,* No. 97:34–38, **1960.** 2 figs., 7 refs. **DWB**—The results of estigation of variations of the electric field, conducted on the diesel ship "Kooperatsia" during trip to the Antarctic are discussed with consideration of various factors affecting these varia- ns. The following three problems were included in the investigation: (1) Development of a thod for observation of the electric field variations above the ocean with electrostatic flux- ter; (2) revealing of daily and latitudinal potential gradient and (3) revealing the "unitary" iations (in respect to Greenwich Time). The gradient of the atmospheric electric field potential ar the ground depends upon the meteorological and local conditions, period of year, latitude, etc. e daily variations depend upon: condensation, dust, smoke, degree of vertical movements, etc. e effect of various conditions on potential gradient is discussed in details and with graphic istration of daily variations of the potential gradient. *Subject Headings:* **1. Electric field er the ocean 2. Antarctica.**—*N.P.S.*

12M–498 551.5:551.46(262.8)

***Nekotorye rezul'taty gidrometeorologicheskikh nabliudeniĭ i rabot gidrometstantsii ftianye Kamni UGMS Azerbaĭdzhanskoĭ SSR za period s ianvaria 1956 po mart 1957 g.** ome results of the hydrometeorological investigations and research at the Neftianye Kamni drometeorological Station of the Azerbaidzhan SSR, Jan. 1956–March 1957.] *Moscow. sudarstvennyĭ Okeanograficheskiĭ Institut, Trudy,* No. 43:3–52, **1958.** 27 tables, 14 figs. LC—An elaborate study of the meteorological and oceanographic conditions at the special ftianye Kamni (offshore oil drilling site) station in the Caspian Sea (40°15′N, 50°50′E, sea m deep) from Jan. 1956 to March 1957. Detailed tables, wind, wave and current roses and les or graphs showing vertical gradients of wind, temperature and humidity, wave conditions d currents based on 2–4 times daily observations of some of the elements for the purpose of ermining the wind pressure and other stresses on the oil drilling installation. Monthly mean, ximum and minimum water temperature data are given for 1954–6. Current wave data for 56–7 are given in great detail, especially for storm periods, and are discussed at length. Tem- rature and wind gradients are calculated and analyzed to give information on the energy and at exchange of the Caspian Sea. *Subject Headings:* **1. Oil drilling oceanographic data 2. ind and temperature gradient data 3. Oceanographic data—Caspian Sea 4. Neftianye mni, U.S.S.R. 5. Wave data—Caspian Sea 6. Current data—Caspian Sea 7. Caspian Sea.** *M.R.*

12M–499 532.593:551.466.3

Lacaze, J. (*Inst. de Mét. et de Physique du Globe, Univ. d'Alger*), **Sur la répartition des tes mers à l'échelle de la météorologie synoptique.** [Distribution of heavy seas on the scale synoptic meteorology.] *France. Comité Central d'Océanographie et d'Etudes des Côtes, Bulletin nformation,* 7(1):32–42, Jan. **1956.** 3 tables, 9 refs. **DLC**—A table shows state of sea and nensions of waves during various synoptic situations listing the meteorological data in a fairly scriptive form. Cold fronts seem to be primarily connected with heavy seas. *Subject Headings:* **State of sea 2. Meteorological data.**—*A. Assur.*

12M–500 551.5:551.468:551.582(266,794)

†Stevenson, Robert E., **Marine climate of Southern California.** *California. State Water llution Control Board, Publication,* No. 20:1–58, **1959.** 22 figs., table, 48 refs. **DWB** (551.46 53oc)—A survey of the factors and conditions which influence the climate of Southern Cali- rnia was conducted from Nov. 1956–April 1957 by the University of Southern California. The mate is characterized as marine and the marine influences are explained. The rainfall and nperature are described as moderate. *Subject Headings:* **1. Marine climatic data 2. Southern lifornia.**—*E.Z.S.*

12M–501 551.506.3(26):551.46(2

Takinami, C. (*Marine Met. Section*), **Report of the marine meteorological observati in the Bristol Bay from 1953 to 1959.** *Hakodate, Japan. Marine Observatory, Marine Me orological Report,* 4(1):191–234, April **1960.** figs., tables. In Japanese. **DWB**—The d obtained by a single ship off Bristol Bay from April to Aug. of each year from 1953–59 exc 1956 were compiled and tabulated. The Tōkei maru with cargo weight of 5385 tons was equip with barometer and anemometer. The elements observed were the general weather, winds, air a sea water temperatures. Figures consist of observation position, yearly and monthly variation weather, monthly wind rose, and a table represents the daily mean value of wind intensity, and sea water temperature for each year (within the zonal position of 55–58°N and 160–164° *Subject Headings:* 1. **Marine meteorological observations** 2. **Oceanographic data** 3. **Bris Bay.**—*K.C.*

SYNOPTIC METEOROLOGY AND FORECASTING

See also: **Sea level and solar activity** (Soskin), 12M–483.

12M–502 551.46:551.509.33(26)(983.):551.4

Belinskiĭ, N. A., **Morskie gidrometeorologicheskie prognozy za 40 let.** [Forty years marine hydrometeorological forecasting.] *Meteorologiia i Gidrologiia,* Leningrad, 11:68–72, 19 **DWB, DLC**—Marine meteorological forecasts began with the development of oceanographic vestigations in 1932, during the Second Polar Year, in which the U.S.S.R. participated. W the knowledge of ice conditions in the Arctic Seas it became possible to study the annual va tions of ice conditions and to develop forecasting techniques. Great impetus to studies on forecasting in the Arctic was given by the establishment of the Central Directorate of the North Sea Route, which contained an interdepartmental bureau on ice forecasting. In 1937 a spe section for marine forecasts was established in the Central Weather Bureau. In 1937–1938 first long rang forecasts were made for non-Arctic seas based upon a method involving a relati ship between the dates of ice phases and the dates of transition of air temperature through ze A large amount of empirical data facilitated the prediction of the appearance of ice, the clos and opening and complete disappearance of ice in the most important parts of the USSR. Vari techniques of short range and long range marine forecasting employed for the Arctic Ocean, various seas of the USSR, etc. are summarized. *Subject Headings:* 1. **Marine forecasting Ice forecasting** 3. **Sea ice** 4. **Long range forecasting** 5. **Arctic.**—*I.L.D.*

12M–503 551.461.2:551.509(26)(98):551.

Belinskiĭ, N. A., **Razvitie metodov Morskikh gidrometeorologicheskikh prognozov Tsentral'nom institute prognozov.** [Development of methods of marine hydrometeorolog forecasting in the Central Forecasting Institute.] *Moscow. Tsentral'nyĭ Institut Prognoz Trudy,* No. 55:48–56,**1957.** **DLC**—Marine hydrometeorological forecasting developed in So Russia in close relation with the opening up of the Northern Sea Route and the preparation ice forecasts for the Arctic region constituted the principal work. The Moscow Hydrometeo logical Institute was established in 1930, and in 1937 a small group was established in the Cen Forecasting Institute to provide marine forecasts. Scientiific studies on marine forecasting w begun in 1938 when also information bulletins containing observations from coastal stations be to be issued. Long range ice forecasts for non-arctic coasts in European and Arctic Russia w first prepared during 1938–39. During this period and up to the second world war extens work was done on the relationship between atmospheric conditions and, appearance and disapp ance of ice, and on the interaction of atmosphere and marine currents in determining the clim of the Arctic. Since the war extensive research has been carried out on the relationship of c ditions of the ice to prevailing meteorological conditions and on short range forecasting of conditions and other marine phenomena. These studies included short range forecasts of peri oscillations of sea level for various seas, of periodic currents, long range forecasts of mont mean fluctuation of sea level, short and long range forecasts of water temperatures and ice c ditions of various seas (Sea of Azor, Baltic Sea, Black Sea) ice forecasts several months advance, etc. Brief descriptions of the various forecast methods used are given and the na of the individual investigations associated with the development and application of the vari procedures are mentioned. *Subject Headings:* 1. **Sea level forecasting** 2. **Ice forecasting Northern Sea Route** 4. **Arctic.**—*I.L.D.*

12M–504 551.446:551.509.58:551.556.81:532.

†Bretschneider, C. L. (*Corps of Engineers, Wash., D. C.*), **Revisions in wave forecasti deep and shallow water.** *Conference on Coastal Engineering, 6th, Univ. of Florida, Dec. 19 Proceedings,* pub. 1958. p. 30–67. 16 figs., table, 36 refs., 44 eqs. **DWB** (627 C748pr Revisions in methods of forecasting waves in shallow and deep water are reviewed. The discuss

cludes methods of measuring fetch, use of variable winds data, and wave spectra analyses. *ubject Headings:* **1. Wave forecasting 2. Wave forecasting techniques 3. Deep water waves.** *-E.Z.S.*

12M–505 551.509.58:551.467:551.461.2

Elliott, Francis E. (*Butler Univ., Indianapolis, Ind.*), **Some factors affecting the extent of e in the Barents Sea area.** *Arctic*, Ottawa, 9(4):249–257, **1956.** 2 figs., 2 tables, 14 refs. **LC**—An attempt is made to explain the areal ice changes in the Barents Sea by means of varia- ons in transport of the Florida Current reflected in mean sea level changes at Charleston, S. C., ıd Miami Beach, Fla. Increasing mean sea level indicates decreased transport and vice-versa, so increasing sea level goes with increasing temperature and vice-versa. This affects Arctic e since 20% of water in area north of Spitsbergen is from the Florida Current. The position the Arctic Front is also very important. Pressure gradients over Arctic front area of Barents ea were calculated. Time lags between fluctuations of mean sea level at Miami and Charleston, ıd related energy transport by the Florida Current and effects in Barents Sea were calculated y means of known current velocities or particle speeds). Distance travelled each month from ıly–Aug. and Dec.–Feb. respectively from 38°N to 60°N are tabulated, giving about a 11 month g as a min to 60°N and 14 month to NW corner of Spitsbergen, or > 25 months all told. Basic e data for 1925–1938, sea level data 1922–1935 and Index of Northerly Winds are tabulated ıd shown graphically, with proper adjustment for time lag of 3 years. Strong flow (low sea vel) means little transport into Barents Sea and much ice—strong N. winds and extensive con- nental polar air mass means more ice and vice-versa. Relationships are thus far only qualita- ve. *Subject Headings:* **1. Ice forecasting 2. Florida Current effects 3. Sea level variations Barents Sea.**—*M.R.*

12M–506 551.46:**551.509.59**:**551.556.8**:532.593:656.61

†James, Richard W., **Application of wave forecasts to marine navigation.** June 1956. hesis (Ph.D.)—New York Univ. Dept. of Meteorology and Oceanography. 82 p. 25 figs. some fold.), 80 refs. **DWB** (551.46 J28ap)—Although the effects of currents, wind and waves ı ship propulsion are discussed the major emphasis is on wave action in relation to marine avigation. Methods for the utilization of synoptic and prognostic wave charts in the selection an approximate least time track, and examples of tracks used by commercial companies are iven. The importance of knowing the resonance period of ships is pointed out. *Subject Head- ıgs:* **1. Wave forecasting 2. Marine navigation 3. Wind effects on waves.**—*E.Z.S.*

12M–507 **551.509.329**:551.465

Kan, S. I., **Neperiodicheskie techeniia v prolivakh Kuril'skoĭ griady i vozmozhnosti ikh redskazaniia.** [Aperiodic currents in the straits of the Kurile chain and means of forecasting ıem.] *Moscow. Tsentral'nyĭ Institut Prognozov, Trudy,* No. 57:132–143, **1957.** 3 figs., table. **LC**—Using observations made in 1953 on current velocities in the upper 10 m layer in the raits of the Kurile chain, the author investigated the characteristics of aperiodic currents by ıe method of harmonic analysis and by that of Maksimov. Only the currents observed from ıne to Oct. are considered. Air currents, corresponding to conditions indicated on synoptic maps ıd maps of streamline flow, explain the currents in Kurile Straits. The action of air currents roducing currents on the surface of the sea consists of large scale phenomena upon which naller phenomena are superimposed. The indices of the former are atmospheric gradients over ırge areas; those of the latter cyclones traveling near the Kurile Chain and over the Sea of khotsk. Equations for forecasting currents in Chetvertyi Kuril'skii (Fourth Kurile) Strait ıd Bussol' Strait are presented, for the former the equation is $y = 0.2x + 13$ where $y =$ mean ırrent for 12 hours projected along the meridian, $x =$ pressure gradient for a large circle taken om a synoptic map at 0900 o'clock for the first 12 hours and at 2100 o'clock for the second 2 hours; for the latter the equations are $x = 0.5y + 1.2z\text{-}64$ (where $x =$ projection of the cur- ent in the Bussol' Strait along the meridian in m/sec, $y =$ difference of pressure between Hokkaido ıd Cape Lopatka in mb and $z =$ geographic latitude of center of the cyclone) and $x = -0.2y$ $- 1.5z\text{-}80$ (where $x =$ projection of current in the strait along the parallel, $y =$ difference of mospheric pressure Progranichnoe-Simushir Island in mb and $z =$ geographic latitude of center cyclone). The relationship between the characteristics of the field of pressure such as index atmospheric circulation, pressure gradients and vorticity of the wind field, and their relation- ıips to the currents are discussed. *Subject Headings:* **1. Ocean current forecasting 2. Kurile slands.**—*I.L.D.*

12M–508 551.465.75 **551.55**:551.461.2

Lauwerier, H. A., **A uniform windfield on a rotating sea in presence of a semi-infinite arrier.** *Amsterdam. Mathematisch Centrum, Rapport Toegepaste Wiskunde,* No. 50, March

1958. 6 p. 2 figs., numerous eqs. Reproduced from typescript. **DWB** [M(055) A528ra N
50]—Emphasis is placed upon the method of investigating the influence of storms upon the Nor
Sea, and a calculation of the elevation of the sea at the barrier due to the stepfunction windfie
By plotting the barrier ζ against the time, t, it has been found that for $0 < t < x$ the infin
barrier designated ζ, between the ranges of $-\infty < x < \infty$, do coincide with the graphs of ζ
a semi-infinite barrier. Graphs are included. *Subject Headings:* **1. Storm effects on sea le**
2. North Sea.—*N.N.*

12M–509 551.509.313:551.511.6:551.4

Nan'niti, Tosio (*Met. Res. Inst., Tokyo*), **A preliminary study for numerical prediction**
oceanic conditions. *Oceanographical Magazine,* Tokyo, 9(1):107–120, Sept. **1957.** 15 figs.
tables, 19 refs., 7 eqs. **DWB, DLC**—It was verified that absolute vorticity is conserved in
sea adjacent to Japan. As the cold water mass appear off Kii Peninsula the depth of the c
rent decreases in comparison with the depth in the Kuroshio region in order that the poten
vorticity will remain constant. But it is very difficult to predict oceanic conditions by numeri
process based on the present status of oceanographic observation as the oceanographers do
have a wide and regular network. *Subject Headings:* **1. Numerical sea condition forecasti**
2. Oceanographic forecasting.—*Author's abstract.*

12M–510 551.509.59:551

Olson, Boyd E. (*USN Hydrographic Office, Wash., D. C.*), **Oceanographic prediction,**
status and challenges. *International Oceanographic Congress, 1st, N. Y., 1959, Preprints*
abstract of papers. Issued Wash., D. C., AAAS, **1959.** p. 776–778. German summary p. 7
DWB (551.46082 I61pr)—The processes with which oceanographic prediction is concerned
enumerated and each is separately examined to appraise the skill in forecasting. The neces
is urged for a carefully planned program for measuring and studying all of the complex varia
involved in oceanographic processes for isolation of the effects of each. *Subject Heading:*
Oceanographic forecasting.—*I.S.*

12M–511 551.465.71 551.509.33:551.526.6(26

Shapkina, V. F., **Dolgosrochnyĭ prognoz temperatury vody v Iaponskom more.** [L
range forecasting of water temperature in the Sea of Japan.] *Meteorologiia i Gidrologiia,* Le
grad, 6:34–38, June **1959.** fig., 4 tables, 5 refs., eqs. **DWB, DLC**—Japanese deep water t
peratures over the period 1928–1939 were analyzed and it was found that in the 25–300 m la
the water temperature anomalies have one sign at all horizons and correspond well in abso
magnitude. The temperature anomalies below the surface form primarily in the fall–wi
period. The amount of solar radiation absorbed in the summer from year to year is small
comparison to the heat loss by evaporation and heat exchange with the atmosphere in wi
The quantitative relationship between the temperature anomaly of the water and various at
pheric processes such as the Siberian anticyclone, Aleutian low and Pacific high, etc. is investig
by means of a series of coefficients that can be introduced into the forecasting equations.
fields are represented analytically by means of Chebyshev polynomials and the results of
investigations are presented in tables giving the relationships for the fall–winter period and
the summer period for the 0–200 m layer. It is concluded that anomalies of water tempera
in the regions of the Kuroshio, Tsusimo and Primor'ia currents are the results of the total e
of variations of the heat balance of the surface and of variation in the currents themselves;
variability of currents and the migration of their axes as well as the variation of their
balance are determined by atmospheric processes since a relationship exists between anom
of water temperature and the above region and the pressure fields over eastern Siberia, the
East and the northwest Pacific Ocean; and the equations obtained on the basis of this relation
enable the forecasting of water temperatures throughout the entire year. *Subject Headi*
1. Long range sea temperature forecasting 2. Heat exchange sea-air interface 3.
water temperatures 4. Sea of Japan.—*I.L.D.*

12M–512 551.509.59:551.556.8:551.466.3:5

Shuleĭkin, V. V., **Fizicheskie osnovy prognoza vetrovykh voln v okeane.** [Physical
for forecasting wind waves in oceans.] *Akademia Nauk SSSR, Izvestiia, Ser. Geofizich*
5:710–724, **1959.** 10 figs., 9 refs., 34 eqs. Transl. into English in the corresponding nu
of its *Bulletin of the Academy of Sciences, USSR, Geophysics Series.* **DWB, DLC**—The phy
basis of the theory of wind waves is established by proceeding from the equation of mech
and the instability of the growth of waves at different stages of development is investigated t
into account the fact that instability increases only during intermediate stages but that a
terminal process it is close to stability. Previous investigations on the development of
waves including their increase in length, the role of internal turbulent friction, their develop

as a function of curvature, etc. are summarized and the theory of the wind wave field on the ocean is developed. The exact integral of the equation of wind waves in the ocean provides a means of determining whether waves are developing or are stable and a solution for determining the relationship between the non-dimensional time and non-dimensional height of a wave. By simple regrouping of multipliers on the scale relationships and by replacing variables formulas and diagrams were obtained enabling the calculation of elements of wind wave for a given wind velocity, durations of its action and distance from the windward boundary of a storm region in the ocean or from the windward shore. The calculations of the aerodynamic coefficient and the estimation of possible errors are presented with the aid of relevant equations. *Subject Headings:* **1. Forecasting oceanic wind waves 2. Wind wave theories.**—*I.L.D.*

12M–513 551.54:551.46(261)

Sorkina, A. I., **Opyt otsenki prakticheskikh vozmozhnosteĭ rascheta vetra nad okeanom po poliu atmosfernogo davleniia.** [Evaluation of the practical possibilities of computing winds above the ocean by using atmospheric pressure fields.] *Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Institut, Trudy*, No. 48:95–103, **1959.** 2 figs., 2 charts. Russian and English summaries p. 102–103. **DWB**—In July and Aug. 1958, a series of observations on the wind was made aboard the "Michael Lomonosov" while in the North Atlantic with the view of evaluating the possibility of computing wind velocities over the ocean from synoptic charts. Existing methods for calculating wind velocities are discussed and analyzed. A great amount of material gained through observation is presented in tabular form. In conclusion the author proposes a simple method for improving the accuracy of determining the horizontal baric gradient for the chart of isobars and, hence, the accuracy of determining the wind velocity. *Subject Headings:* **1. Atmospheric pressure fields above the sea 2. North Atlantic.**—*M.B.B.*

12M–514 551.465.71(261/264)

Worthington, L. V. (*Woods Hole Oceanog. Inst., Mass.*), **Response of the Atlantic Ocean to known climatic variations.** *National Research Council, Wash., D. C., Publication*, No. 473: 38–44,**1957.** 4 figs. **DWB** (551.46 N277pr),**DLC** (GC57.N33, 1956)—A discussion pointing out that there is evidence that the Atlantic Ocean is constantly changing as it adjusts itself to climatic changes. Although we cannot say how much the oceans as a whole contribute to climatic changes, most likely their effect is thermostatic, since we have had some indication that increasing atmospheric warmth at high latitudes results in loss of transport in those currents which carry warm water to the high latitudes. *Subject Headings:* **1. Climatic effects on oceans 2. Atlantic Ocean.**—*N.N.*

Wind Effects

See also: **Water exchange through a strait** (Pastors), 12M–392; **Wind set-up in shallow-water** (Tickner), 12M–401; **Wind fetch** (Reid), 12M–479; **Wave forecasts for marine navigation** (James), 12M–506; **Wind induced advection** (Eber), 12M–767.

12M–515 551.466.34 551.465:532.593

Akedo, Ken (*Kobe Marine Obs.*), **On the swell in eastern Setonaikai, Kiisuido and the coast of Shikoku.** *Umi to Sora* (*Sea and Sky*), Tokyo, 34(3):58–62, **1958.** 7 figs., table. In Japanese; English summary p. 58. **DLC**—Using the data obtained at lighthouses in various sea areas in 1956, the sea waves, the wave and wind scale, and the swell directions were studied statistically in the 12 bays of Shikoku, eastern Setonaikai, and in the Kiisuido coastal vicinity. The wave heights were compared with the theoretical values shown by SVERDRUP, PIERSON and NEUMANS' diagram. The progression of swell from off Shikoku to Setonaikai was investigated with the use of data from three typhoons in 1956. *Subject Headings:* **1. Swell measurements 2. Japan coast.**—*K.C. and author's abstract.*

12M–516 551.501.75:551.554:551.46(26)

Brocks, Karl (*Geophy. Inst. Hamburg, Germany*), **Measurements of wind profiles over the sea and the drag at the sea surface.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 742–744. 3 eqs. German summary p. 744. **DWB** (551.46082 I61pr)—Measurements of vertical profiles of wind velocity, air temperature and water vapor over the North and Baltic Seas were made by a new apparatus. Wind profile measurements are briefly described. Adiabatic wind profiles and drag coefficients are given. The new apparatus consists of a floating buoy with a weight under water for greater stability and an aluminium mast. Damping plates and a guide pin diminish vertical movements and horizontal turning. *Subject Headings:* **1. Wind profile measurement devices 2. Wind profile over sea 3. North Sea. 4. Baltic Sea.**—*I.S.*

12M–517 551.556.8:532.593:551.46

Darbyshire, I., **A further investigation of wind generated waves.** *Deutsche Hyd graphische Zeitschrift,* Hamburg, 12(1):1–3, 1959. 18 figs., 4 tables, 19 refs., 22 eqs. Engli German and French summaries p. 1. **DWB**—Sixty-four wave records taken by the O.W. "Weather Explorer" are investigated and Fourier analyzed. The relation between the wi speed and the equivalent height H, and the frequency of maximum amplitude on the spectrum, do not differ greatly from those obtained in 1955. The wave spectrum, however, can now shown to be reducible to the same form for all wind speeds for large fetch, H_f^2/H^2 being a fur tion of $(f-f_o)$ only. The same function applies for shorter values of fetch, only, then, t relation is between H_f^2/yH^2 and $y(f-f_o)$, where y is the ratio of the values of H and l/f_o at t short fetch to those for the same wind speed at infinite fetch. Agreement can be found with previous result by R. W. Burling (1955) under certain conditions. For a fetch of 4 mi, agre ment to the same order is obtained with the values of mean square slope found by C. S. C and W. H. Munk (1954). It has not been possible to find agreement with the results of Proje SWOP (J. Chase, L. J. Cote, W. Marks and others [1957]). *Subject Headings* **1. Wi effects on waves.**—*Author's summary.*

12M–518 551.515.2:551.465.75:532.5

Donn, William L. and McGuinness, William T. (*both, Lamont Geol. Obs., Palisades, N. Y*) **Storm swell in the Lesser Antilles, West Indies.** *International Oceanographic Congress, 1 N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 746–7 French summary p. 747. **DWB** (551.46082 I61pr)—A brief description of an attempt to expla severe and often very damaging surf conditions experienced in the Lesser Antilles, particula in Barbados. The explanation given is in terms of tsunami or of submarine landslide acti The records from wave and tide recorders installed during the IGY on the eastern and weste coasts of Barbados show that the damaging surf is a result of high swell of the type generat by severe marine storms. In this case the high swell is related directly to intense extratropi cyclones in the middle latitudes of the north Atlantic Ocean. *Subject Headings:* **1. Sto swell formation 2. Barbados, West Indies.**—*I.S.*

12M–519 551.466.3 551.556.8:551.46

Dorrestein, R. (*K. N. M. I. DeBilt, Netherlands*), **Some frequency spectra of a moder wind-generated sea.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of stracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 747–749. table. German summa p. 749. **DWB** (551.46082 I61pr)—With a floating wave meter installed on the light-ves "Texel" in the southern North Sea, at 53°01′N, 4°22′E a number of wave records were obtain during early 1958. The British wave-analyzer was used to analyze records of the vertical accele tion, vertical velocity and height of the water surface, taken within one-half hour of each oth Results of the analysis are described and presented in tabular form. *Subject Headings:* **1. Wi wave frequency spectra 2. North Sea.**—*I.S.*

12M–520 551.556.8:551.465.75:525.6 551.46

Fischer, Günter (*Internatl. Met. Inst., Stockholm*), **Ein numerisches Verfahren zur rechnung von Windstau und Gezeiten in Randmeeren.** [Numerical experiment on calcu tion of wind surge and tides in bordering seas.] *Tellus,* Stockholm, 11(1):60–76, Feb. 19 10 figs., 8 refs., 26 eqs. English summary p. 60. **DLC**—A finite difference method for termining water heights and movements in adjacent seas is developed. For this purpose vertically integrated equations of motion and the continuity equation are transformed into explicit system of difference equations, which are solved stepwise in time with an electro computer. The question of numerical stability is investigated in detail. To obtain computatio stability for the system in question, it is not sufficient to satisfy a condition similar to Courant Friedrichs Lewy criterion, as there is also an upper limit of the timestep itself, wh depends on the frictional coefficient and the Coriolis parameter. The influence of a smooth technique and the mesh size of the grid on the results is also examined. Some computations tidal waves and currents in the North Sea, where the wave was prescribed only at the open e give a reasonable agreement with observed conditions. *Subject Headings:* **1. Wind surge calc tions 2. Tidal wave 3. North Sea.**—*Author's abstract.*

12M–521 551.515:551.553.8(265) 551.466

§*Fukuoka District, Japan. Meteorological Observatory et al., **Report on the Gustwindst Project in the area of the East China Sea, the Kyushu District and its adjacent seas in period Jan. 21–Feb. 20, 1955.** *Japan. Meteorological Agency, Memoirs,* 40(2), **1958.** 14 212 figs., tables. In Japanese; t-p. and legends in English. **DWB**—"Gustwindstorms," or squ cause considerable damage and loss to shipping in the East China Sea even when not associ typhoons, owing to lack of warnings. A project was initiated in 1955 to study meteorological itions during squalls. A total of 35 Coast Guard vessels, 70 fishing vessels, 23 light houses 28 meteorological stations in the Kyushu District took hourly or 3-hourly observations during windstorms in the area from Jan. 21–Feb. 20, 1955. Seven cases were studied, two of which classical examples: one on an instability line in a warm sector on Jan. 30, 1955 and one ng a cold-wave on Feb. 20, 1955, 5–10 hours after the cold front passage. These two cases analyzed in detail and the meteorological data presented in charts, graphs, analyzed synoptic ts, isochromol charts, time and space cross sections, etc. Tornadoes were found to be ciated with the instability line on Jan. 25, 1955 at Naha in the Ryukyu Islands. Most cases qualls occurred with meridional flow on the broad weather charts. *Subject Headings:* 1. **twindstorm Project 2. Squall analyses 3. Tornadoes, Naha (Jan. 25, 1955) 4. East ia Sea 5. Naha, Ryukyu Islands. I. Nagasaki, Japan. Marine Obs. II. Maritime ty Agency, Tokyo.**—*M.R.*

12M–522 551.466.34

Gelci, R.; Cazale, H. and Vassal, J. **Sur le déplacement et la formation des aires généra-es de houle au Maroc.** [Traveling and formation of areas productive of swell in Morocco.] *t, Morocco. Service Scientifique Chérifien. Institut de Physique du Globe et de Météoro-, Annales,* 16:143–152, **1956.** 10 figs., 7 refs. **DLC**—Review of the principles of the iod based on propagation diagrams and application of this method to study of nine swells rved at Casablanca during the years 1933 and from 1953 to 1955. The propagation diagrams it a synoptic representation of the productive areas and of the conditions of swell propaga- and the approximate determination of the arrival time of important swells. They provide ence of "synchronism swells" difficult to foresee by other methods, and the peculiar mecha- of their formation is likely to supply certain information on spectral growth. *Subject lings:* **1. Swell propagation 2. Casablanca, Morocco.**—*A.V.*

12M–523 551.556.8:551.466.6:532.59

Grushevskiĭ, M. S., **K opredeleniiu profilia dlinnoĭ volny, vyzvannoĭ vetrom.** [Determi-on of the profile of a wind-induced long wave.] *Moscow. Gosudarstvennyĭ Okeanograficheskiĭ tut, Trudy,* No. 37:59–72, **1959.** 6 figs., 2 tables, 45 eqs. **DWB**—Mathematical formulation ave formation under action of wind is briefly described with consideration of changeable water in a channel of variable depths. The equation for a long wave of small amplitude is used his method for computation of the kinematics of wind waves, inducing general wave motion the corresponding current. The action of wind on the long wave in this case becomes valent to volumetric force, applying to whole mass of water, but not tangential to the surface With this approach it is possible to avoid the complicated phenomena, occurring on the dary between water and air. This method is not completely developed and needs improve-. Mathematical determination of the wave heights are made for different shapes of the nel cross sections: concave or convex parabola, sinusoidal or straight inclined side surfaces. results of the determination are discussed in detail and illustrated by a set of curves. *Subject lings:* **1. Wind effects on waves 2. Wave formation.**—*N.P.S.*

12M–524 551.506.1:551.46(265):551.515.2(265)

Hakodate, Japan. Marine Observatory, **On the meteorological conditions in the north-part of the North Pacific Ocean (the salmon fishery grounds).** Its *Marine Meteorological rt,* 3(1):1–97, March **1959.** Numerous charts and tables. In Japanese. **DWB**—Weather ts made by 11 fishery ships, from east Khamchatka to west of the Aleutian Islands (160– E sea area) during May–Aug. of 1959. The principal data obtained by each ship are included bles and figures. The conditions of cyclone formation and propagation and its intensity in rea of 150–180°E, and the central pressure from 980 mb to above 1000 mb. By the same od, the condition of upper layers; the track of the cyclone from south to east sea face of n, Amur region, Okhostk, E. Siberia, and subtropical zone. Then the differences are com- l with weather charts made at the same time and date. Some discussion is included on the ation of the cyclone. *Subject Headings:* **1. Marine meteorological data 2. Weather ship naries 3. North Pacific Ocean.**—*K.C.*

12M–525 551.506.1:551.46(265)

Hakodate, Japan. Marine Observatory, **Marine Meteorological Report,** Vol. 2, No. 1, h **1958.** 138 p. Numerous charts and tables. Contents: **Report of the marine meteoro-al observations in the northern part of North Pacific Ocean, 1957. On the current in iorthern port of North Pacific Ocean in summer. On the meteorological conditions in iorthern part of North Pacific Ocean, May–July 1957. DWB**—The first part of this report contains the observational data made by 17 fishery ships in operation during May–Au 1957. The results are tabulated and include monthly statistics of frequency of observatio sea-face region, passage of each ship, and sea chart with the condition of fog, temperature sea temperature of surface. The characteristic in May is the existence of a strong cyclon June, the weak track of a cyclone through the Aleutian is directed 40–43°N toward Eas 175–180°E toward North; in July, less frequent cyclones and mild climate associated with sea fog; in Aug., appearance of anticyclone and less fog. Tables show daily condition of cy regime, wind speed and position and occurrence, and low level cyclone and explain thoro its nature and development. A conspicuous phenomenon from Aleutian Islands to Chi Islands was the surface current. For the purpose of Salmon fishery a study of cyclon anticyclone on the surface and upper atmosphere has been tabulated showing a travelling time, central pressure, trough and cold front type of a particular day found by each ship on ent isobaric surfaces. *Subject Headings:* **1. Marine meteorological observations 2.** **Pacific Ocean.**—*K.C.*

12M–526 551.556.8:551.461.2 551.

Hidaka, Koji (*Tokyo Univ.*), **Deformation of ocean surface induced by winds.** *Univ. Geophysical Institute, Geophysical Notes,* 8(1), Contribution No. 11, June **1955.** 4 tables, 11 refs., 28 eqs. **DLC.** Reprinted from *Oceanographical Society of Japan,* *Journal,* 10(4):175–188, **1954.**—On the assumption that the water is uniform and the circu is entirely induced by the superincumbent wind system over an ocean covering the earth uniform depth, an attempt was made to estimate the possible amount of deformation of t surface of the Pacific. The equations of motion and continuity and the wind stress distri were described, and computed meridional distribution of wind stress, meridional variation of surface height, and numerical values of varied coefficient were compiled in tables. It is note the surface deformation is chiefly determined by the E-W component of wind stress and t surface profile has a marked asymmetry on both sides of the equator; in the southern hemi a sudden fall of the sea surface occurs in the latitude of 25°S and above at 60°N; the diff of water height between 25°S and 60°S is about 11 m and 14.4 m for the average of 177.°5W and for the meridian of 142.°5W, respectively. *Subject Headings:* **1. Wind effe** **sea surface 2. Pacific Ocean.**—*Author's abstract.*

12M–527 551.557:519.2

Hofmeyr, W. L., **An analysis of upper wind over the Southern Ocean in summer.** *Africa. Weather Bureau, Notos,* 6(3/4):123–126, **1957.** fig., 2 tables, 4 refs. **DWB**—An expressions are presented for the smoothing or "weight" function which is in effect op when one wishes to smooth an evenly-spaced time series and adopts WHITTAKER's princ minimizing the sum of the squared third differences of the graduated values plus a constan the squared differences between crude and graduated values. The solution of the problem by WHITTAKER for the one-dimensional case, is extended to a grid of evenly-spaced data complete solution of the two-dimensional case is presented here. *Subject Headings:* **1.** **wind analysis 2. Southern Ocean.**—*Author's abstract.*

12M–528 551.556.8:55

Ichiye, Takashi (*Oceanog. Inst., Florida State Univ.*), **On the response of western bo** **currents to variable wind stresses.** *Journal of Geophysical Research,* Wash., D. C., 64(189, Feb. **1959.** 9 figs., 15 refs., 7 eqs. **DLC**—The forced response of ocean currents, larly western boundary currents, to a variable wind system is analyzed. By dividing a into a western zone and an interior region, a simple relation between wind stress torque whole ocean and mass transport of the western current can be obtained. Mass transport stationary case is compared with that derived from Stòmmel's frictional boundary theory mass transport for wind stresses changing periodically is computed for two kinds of b conditions which lead to almost the same result. In a barotropic ocean or in a barotrop of a two-layered ocean, the amplitude of fluctuation of western mass transport approa equilibrium state with a phase lag of two to four days behind the wind when the period one month. On the other hand, amplitude and phase lag of fluctuation in the baroclinic m changing wildly, and approach the equilibrium state for a period longer than 10^3 days. T of non-linear inertia terms in the western current zone is negligible to the mass transpo The divergence in the western zone causes waves moving southward and particularly th in the baroclinic mode to have a resonance period of about five months. Such a peri to be associated with the observed predominance of half-year period fluctuation in the Gul mass transport. *Subject Headings:* **1. Wind effects on currents 2. Boundary curr** **Gulf Stream.**—*Author's abstract.*

12M–529 551.46.086 551.556.8:551.466.31

Ivanov, A. A. (*Marine Hydrophysical Inst., Moscow*), **Study of wind disturbance.** *Inter-*
ional Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers. Issued
ash., D. C., AAAS, **1959.** p. 756–759. eq. In English and Russian. **DWB** (551.46082
pr)—A brief description of wind wave studies carried out by Marine Hydrographical Institute,
ademy of Sciences, U.S.S.R. and the improved instruments developed for such investigation.
ention is made of a new wave recorder—a photowave recorder—which records not only individual
ves but also the changes at the point of observation. The procedural details of how this
order can be used in measuring waves are given. *Subject Headings:* **1. Wind effects on**
ves 2. Wave recorders 3. Photowave records.—*I.S.*

12M–530 551.556.8:551.466.31

Ivanov, R. N., **O mekhanizme peredachi energii vetra techeniiu.** [Mechanism of transfer
wind energy to currents.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 5: 673–677, **1958.**
igs., 3 refs., 12 eqs.Transl. into English in the corresponding number of its *Bulletin of the Academy*
Sciences USSR, Geophysics Series. **DLC**—The author clarifies the role of dynamic pressure
a wave in the transmission of wind energy to a current. Experiments for studying the influence
wave ripples upon the origin of stress upon a water surface, carried out in an experimental storm
sin in order to investigate the origin of currents are described briefly. The apparatus consisting
a frame with two parallel rigid tubes, between which wire slats are stretched, is described with the
of a diagram. The equation developed for expressing the dynamic face of wind pressure f_p on
wave surface is $f_p = \delta_a(h/\lambda)(V - c_1)^2 \int_0^1 \chi d\eta$ where δ_a = atmospheric density, V = wind
ocity, $c_1 = u_{z=0} + c$; $u_{z=0}$ = average velocity of current for period of wave, c = phase velocity of
ve), h = height of wave, λ = wave length, χ = some non-dimensional function y/h (y = eleva-
n of surface of wave element above its t foot). The function χ is computed from the expression
$- p' = \delta d(V - c_1)^2\chi$ where p'' and p' are pressure of wind upon unit surface corresponding to the
ndward and lee slopes of the wave. Equations determining the function χ are presented so that
equation $f_p = 0.30\delta_a n(h/\lambda)^2(V - c_1)^2$ is obtained. This expression for dynamic wind pressure is
tten usually $f_p = k_p\delta_a(V - c_1)^2$ (where $k_p = 0.30_n(h/\lambda)^2$). By multiplying both parts of this
ation by λ a formula analogous to Newton's formula for resistance of a body enveloped by a fluid
btained. The coefficient of resistance is $c_2 = 0.30_n(h/\lambda)$ so that $k_p = (h/\lambda)c_2$ Newton's formula
coefficient of resistance depends upon the shape of the body, i.e., the shape of the wave c_1 and
k_p depends upon the Reynolds number. The mechanism of transfer is analyzed and also for a
nplex wave, namely in a wave of several periods. *Subject Headings:* **1. Wind stress on water**
Wind driven currents.—*I.L.D.*

12M–531 551.515.1/2:551.466.31:532.59

Kajiura, Kinjiro, **Forced wave caused by atmospheric disturbances in deep water.** Texas
& M. College. Dept. of Oceanography, Contract Cwb-8717, Technical Report 1331-1, Oct.
6. 22 p. 9 figs., 5 refs., numerous eqs. **DWB** (M(051)K12fo)—The two dimensional forced
ve in deep homogeneous water generated by a moving storm is discussed. The inverse baro-
ric deformation of the sea surface is a fairly good approximation to the actual condition near
center of the storm, but the flow of water is quite different from that expected from the
logy of the one dimensional progressive wave. The geostrophic flow related to the wind stress
l is predominant, and a permanent deformation of the water surface behind the storm is
ated, which is balanced by the geostrophic flow. The critical case when the velocity of the
m movement is the same as the velocity of free waves in water, is briefly discussed. In this
e, the two dimensional model gives quite a different picture compared with the one dimensional
lel. It is found that a resonance condition does not obtain as in the simple one-dimensional
blem for the critical speed. It is noteworthy that the two-dimensionality and the presence of
iolis force will allow the establishment of an equilibrium height of the moving forced surge,
n in the absence of bottom friction. *Subject Headings:* **1. Atmospheric disturbances 2.**
ather effects on sea 3. Forced waves.—*Author's abstract.*

12M–532 551.515.7(265.4):551.526.6:551.577.32(52)

Kinoshita, M., **On the relation between Okhotsk Sea anticyclone and water temperature**
Bai-u season. *Journal of Meteorological Research*, Tokyo, 11(11):914–920, **1959.** 7 figs.,
e, 3 refs. In Japanese; English summary p. 914. **DWB, DLC**—As one of the factors
ponsible for the formation of Bai-u phenomenon in the Far East, the Okhotsk Sea anticyclone
lominant. It seems very important for forecasting the Bai-u phenomenon to estimate the
er surface temperature of the Okhotsk Sea, and this temperature has an effect on the stability

of Okhotsk Sea anticyclone. About the drought in the dry Bai-u in 1958, it should be expla that the Okhotsk Sea anticyclone was unstable, and that the water temperature of the Okh Sea was warm. *Subject Headings:* **1. Okhotsk Sea anticyclone 2. Bai-u 3. Sea su temperatures 4. Okhotsk Sea.**—*Author's abstract.*

12M–533 551.46

Lineikin, P. S., **Techeniia i stratifikatsiia vod v more.** [Currents and water stratific in the sea.] *Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Institut, Trudy,* No. 47:13–29, ref., 79 eqs. **DWB**—The author presents a theoretical investigation of wind currents i unbounded sea for any distribution of tangential stress on the sea surface and for a de gradient varying with depth. Particular attention is given to deep water currents and turbances in the density field. The fundamental differential equation for $f(z)$ is derived, nan

$$\left[1+\alpha^2\left(\frac{d}{d\bar{z}}\bar{\mu}\frac{d}{d\bar{z}}-\xi\tau\right)^2\right]\frac{d}{d\bar{z}}\frac{\tau\xi\frac{df}{d\bar{z}}-\epsilon\frac{d}{d\bar{z}}\bar{\mu}\frac{d^2f}{d\bar{z}^2}}{\Phi(\bar{z})}-\beta^2\xi\left(\tau\xi f-\frac{d}{d\bar{z}}\bar{\mu}\frac{df}{d\bar{z}}\right)=0$$

Its solution for different limiting conditions, the derivation of equations for determining velocity of deep water currents and the calculation of their velocity are presented. *Subject H ings:* **1. Wind currents 2. Deep water currents.**—*I.L.D.*

12M–534 551.509:318:551.46:639.2

Mertins, Hans Otto, **Südsturmlage bei Svinöy und der Ostkanteruhiges Wetter au Otterbank.** [South storm situation at Svinöy and the Ostkante—quiet weather on the bank.] *Wetterlotse,* Hamburg, No. 116:98–101, April **1957.** fig. **DLC**—In winter and s there is often high pressure over Scandinavia while depressions approach from the west. cause short southerly gales on the south and central Norwegian coast, decreasing rapidly and NE. The strong wind zone extends in weakened form to the Shetlands but a little fu west at Otterbank (60.3°N, 4°W) quiet weather suitable for fishing prevails. *Subject Head* **1. Weather types 2. Fisheries 3. Scandinavia.**—*C.E.P.B.*

12M–535 91.04(99) 551.556.8:551.466:5

Morozov, A. P., **Nabliudeniia nad morskim volneniem.** [Observations of sea wav rough sea.] *Sovetskaia Antarkticheskaia Ekspeditsiia, 1955—,* [*Materialy*], Vol. 5, issued grad **1959.** p. 138–143, 2 figs., 2 tables, 2 foot-refs. **DLC**—The study of sea waves und influence of wind in the southern polar basin was conducted by the Second Antarctic Expe on the diesel-electric ship "Ob." Visual consideration was given to the following wave elem type, form, degree of waving, sea surface conditions and direction of the propagation. actual measurements of the height and period of waves were made by the waveograph an general character of the waves is illustrated on stereo-photographs. About 770 visual observ were made in the Atlantic and Pacific Oceans, Bay of Bengal and Arabian and Red Seas. instrumental recording of the height and period of waves were made on drifting ships numerous of hydrological stations shown on the map between Antarctic, African and shores. The methods of observation and equipment are described in the text with details. results of observations are tabulated and analyzed with respect to their intensity, duratio frequencies and are illustrated on a graph. *Subject Headings:* **1. Ocean wave analysis 2. effects on waves 3. Antarctic Ocean.**—*N.P.S.*

12M–536 551.465.5:55

Neuman, Gerhard (*New York*), **On the mass transport of wind-driven currents baroclinic ocean with application to the North Atlantic.** *Zeitschrift für Meteorologie,* 12(4/6):138–147, April/June **1958.** 5 figs., numerous refs., 14 eqs. **DWB, DLC**—The w the dynamics of the wind driven circulation in the oceans carried on by W. Ekman, Sverdrup, W. B. Stockmann, H. Stommel, W. Munk, K. Hidaka, W. Hansen and A. is summarized. The horizontal mass transport of wind generated currents in a stratified o determined by integrating the hydrodynamic equations vertically over the depth z betwe surface ζ and the lower boundary D. From these equations the author derives the basic ential equation for horizontal mass transport in the wind driven layer, namely:

$$\frac{\partial f}{\partial x}\frac{\partial\psi}{\partial y}+\frac{\partial\tau_y}{\partial x}-\frac{\partial\tau_x}{\partial y}+r\nabla^2\psi-\frac{\partial p_D}{\partial x}\frac{\partial D}{\partial y}+\frac{\partial p_D}{\partial y}\frac{\partial D}{\partial z}=0$$

nere ∇^2 is the Laplacian operation. In this equation $p_D = g\bar{\rho}(\zeta - D)$ is the pressure at variable pth D and

$$\bar{\rho}(x, y) = \frac{1}{\zeta - D}\int_D^\zeta \rho(z)dz.$$

applying the equation for horizontal mass transport spherical coordinates are introduced into e vertically integrated equation of motion before differentiating and the equation of continuity r a spherical earth is used. The resulting differential equation for the stream function ψ is

$$\Delta^2\psi + \left(\frac{\partial f}{\partial x} - \frac{f}{D}\frac{\partial D}{\partial x} - \frac{r}{D}\frac{\partial D}{\partial y}\right)\frac{\partial \psi}{\partial y} + \left(\frac{f}{D}\frac{\partial D}{\partial y} - \frac{r}{R}\cot\theta - \frac{r}{D}\frac{\partial D}{\partial x}\right)\frac{\partial \psi}{\partial x}$$
$$= \operatorname{curl}_z\tau + \frac{\tau_x}{D}\frac{\partial D}{\partial y} - \tau_y\left(\frac{1}{D}\frac{\partial D}{\partial x} + \frac{\cot\theta}{R}\right)$$

here $\theta = 90° - \psi$ and R = radius of the earth. The integration of this equation and its use in mputing mass transport in the North Atlantic for the mean field of Feb. are illustrated. Also e structure of the Gulf Stream and of the Brazil Current are discussed. *Subject Headings:* **Wind driven currents 2. Baroclinic layer of the sea 3. Water mass transport 4. Brazil urrent 5. Gulf Stream 6. North Atlantic.**—*I.L.D.*

12M-537 551.556.8:551.461.2:551.465.75

Neumann, Gerhard (*New York Univ.*), **Notes on the stress of light winds on the sea.** *merican Meteorological Society, Bulletin,* 40(3):146–148, March **1959.** 10 refs. **DWB, DLC** -Since E. L. Deacon expressed doubts about the use of the so-called "slope method" (*A.M.S., ull.,* Nov. **1957**). The present note attempts to clarify the problem. It shows how discrepancies etween the two basically different methods (1) wind profile observations, and (2) slope observaons cannot be removed by ignoring the results of one at the expense of the other method. *Subct Heading:* **1. Wind stress on water.**—*W.N.*

12M-538 551.464.1 551.583.14:551.526.64(265,266)

Robinson, Margaret K. (*Scripps Inst., La Jolla, Calif.*), **Concerning climatic change in the eep waters of the North and South Pacific Oceans.** *International Oceanographic Congress, st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 107–)9. French summary p. 108–109. **DWB** (551.46082 161pr)—Data collected at 108 stations in e years 1824, 1827, 1848, 1875, 1887, 1934, 1935, 1936, 1947 and from 1949 to 1958 were ompared with the reference station data, which were collected in the period 1929–1932 at 81 ations by "Carnegie," "Dana," "Scoresby," "Discovery II" and International Fisheries expediions. Analysis of serial temperature and salinity data shows no evidence of climatic warming deep waters of the Pacific Ocean between 100 and 5000 m similar to the warming found in rface temperature data. The analysis does give, however, evidence of large random fluctuations both temperature and salinity fields between 100 and 1000 m, and small random fluctuations elow that level. *Subject Headings:* **1. Climatic changes 2. North Pacific Ocean 3. South acific Ocean.**—*I.S.*

12M-539 551.463.6:551.526.6:551.54(266)

Roden, Gunnar I., **Spectral analysis of a sea-surface temperature and atmospheric presire record off southern California.** *Journal of Marine Research,* New Haven, Conn., 16(2):)–95, Aug. **1958.** 3 figs., 4 refs **.DWB, DLC**—Sea-surface temperature and atmospheric presire records during the past 40 yrs indicate that an inverse relation exists between the temperature La Jolla, California, and the pressure difference at lat. 30°N, long. 110°–130°W. A spectral ialysis of these records is made and the energy density, autocorrelation, coherence and phase elations are investigated. *Subject Headings:* **1. Sea surface temperature-pressure relationships Pressure-temperature correlations 3. La Jolla, Calif.**—*Author's abstract.*

12M-540 551.557:551.542.1:551.467

Romanov, U. A. (*Inst. Ocean. Acad. Scien. Moscow*), **On the relation between geostrophic nd surface wind.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts f papers.* Issued Wash., D. C., AAAS, **1959.** p. 722–724. 3 eqs. **DWB**—This paper conins a statistical study of the relationship between the geostrophic wind and the wind measured a meteorological station. Observational data were gathered at meteorological stations on the rifting ice islands of the Arctic and on low flat islands where the orographical wind distortion all directions was found to be very small. More than 13,000 calculations were made of wind om isobars with an even number of comparisons of this wind with that observed synchronously at the meteorological stations. *Subject Headings:* **1. Geostrophic wind analysis 2. Surf wind analysis 3. Statistical analysis 4. Sea ice.**—*I.S.*

12M–541 551.556.8:551.466.3:53

Sorkina, A. I. (*State Ocean. Inst., Moscow*), **Calculation of wind field above sea surfa** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Iss Wash., D. C., AAAS, **1959.** p. 780–782. In English and Russian. **DWB** (551.46082 I61pr The method for calculating wind field above the sea surface is described. Before calcula wind waves and currents it is necessary to determine wind conditions influencing them. Met of studying wave disturbances and wind currents are described. Comparison of the met indicates that the calculated wind velocity relative to a gradient wind velocity differs from average observations by no more than 4–10%, while the calculated angles of indraft exceeds observed angles by no more than 10%. *Subject Headings:* **1. Wind effects on waves 2. W currents.**—*I.S.*

12M–542 551.556.8:551.

Stepanov, V. N., **O glubine vetrovogo peremeshivaniia v Mirovom okeane.** [Depth wind influence in the oceans.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofizich.*, No. 5:768–7 **1959.** 3 figs., table, 4 refs. Transl. into English in the corresponding number of its *Bull of the Academy of Sciences, USSR, Geophysics Series.* **DWB, DLC**—The author discusses effect of wind upon the depth of mixing in the oceans, the investigations of A. DEFANT on variation of the thickness of the surface layer in the ocean, the Rossby-Montgomery formulas calculating the thickness of the homogeneous layer on the basis of latitude and wind velocit the sea surface area and the calculations of J. LUMBY by means of these formulas. In view the fact that the variation of surface theickness with latitude as computed by the formulas ROSSBY and MONTGOMERY is opposite to that which should take place corresponding to wind since the data of A. DEFANT refer chiefly to tropical latitudes the author compared their con sions with actual observations carried out in the Indian Ocean by the Soviet Antarctic Expedi on the "Ob" during May–June 1956. A comparison of wind force with the thickness of homogeneous surface layer showed a great variability with a marked dependence of thickn upon wind. The thickness of the layer computed by the Rossby-Montgomery formuli va opposite to the wind. The computations of thickness obtained by J. LUMBY with the aid resultant wind led to less accurate results. Data on the deviations of the computed thickness the surface thickness from observed values along the hydrological section Mirnyi-Strait of A are presented. The errors in the ROSSBY-MONTGOMERY formuli are due to the term 1/s which is responsible for the opposite variation of surface thickness to the actual variation. S *ject Headings:* **1. Wind influence in the oceans 2. Soviet Antarctic expeditions 3. Ocea graphic data.**—*I.L.D.*

12M–543 551.509.329:551.461.2(521.4):551.556.8 551.4

Suzuki, H., **On the wind waves along Echizen coast, Pt. 1.** *Journal of Meteorolog Research*, Tokyo, 11(3):236–240, March **1959.** 7 figs., 6 refs. In Japanese. **DWB, DLC**— the purpose of sea surface forecasting, the investigation of wind wave scale between Fukui dist and Shikeura harbor was carried out from Feb. to March of 1958, by the Pierson-Neumann-Ja method. Using hourly variation shown on surface charts, it was intended to illustrate the r tions between measured value of wind direction and that of surface charts, speed of wind wa and minimum blowing distance as well as the ratio of wave energy. It is concluded that in period, four storms that turned into four scales of wind wave had occurred, but they were cluded in a cold front pattern similar to the patterns of seasonal wind. *Subject Headings* **Sea surface forecasting 2. Wind waves 3. Echizen coast, Japan.**—*K.C.*

12M–544 551.506:551.55(2

*Texas. Agricultural and Mechanical College. Department of Oceanography, **Wind velo data, Jan. 1951 to Sept. 1952.** Contract N7onr-48704, Project 083-071, Project 30, Tran processes operating at the ocean boundaries, Data Report—Section 3, March **1953.** 96 p. Enti tables. **DWB**—Hourly data for wind speed and direction 64 ft above mean water level, Jan. Sept. 30, 1951. Similar data at 8, 16, 32, and 64 ft above mean water level, Oct. 1, 1951–Aug. 1952. All measurements made on an offshore oil platform south of Louisiana with a Green ei contact weather vane and standard three-cup anemometers. *Subject Headings:* **1. Wind 2. Marine meteorology 3. Gulf of Mexico.**—*M. P. Kramer.*

12M–545 551.513.1:551.465.7(2

Uda, Michitaka, (*Tokyo Univ. of Fisheries, Tokyo*), **Research on the fluctuation of North Pacific circulation, Pt. 1.** (In: UNESCO Symposium on Physical Oceanography, To

t. 1955, **Proceedings,** pub. **1957.** p. 112–113. French summary p. 112). **DWB**—A report the fluctuations of the Oyashio Current and its relation to the atmospheric circulation and to distribution of the dichothermal waters. *Subject Headings:* **1. Ocean-atmosphere relation-ips 2. Oyashio Current.**—*E.Z.E.*

12M–546 551.556.81:551.515.2:551.466.31
Unoki, Sanae (*Oceanog. Lab., Met. Res. Inst., Tokyo*), **Energy of waves and some other bjects (On the ocean waves due to tropical cyclones, Pt. 4).** *Meteorological Society of pan, Journal,* Ser. 2, 35(6):350–361, Dec. **1957.** 10 figs., 5 tables, 14 refs., 7 eqs. **DWB**—e total energy of waves raised in a typhoon is estimated and the problem of what percentage the wind energy dissipated by surface friction is needed for the formation of waves is investi-ted. Several maps are presented, showing the mean distribution of wind waves, swell and ve steepness in a typhoon. The relations between wind velocity and wave height or period, d between the steepness and age of waves are discussed. On the basis of wave energy spectra Onahama the distribution of wave energy in a typhoon progressing on the open sea is derived. *bject Headings:* **1. Wind effects on waves 2. Typhoon effects on waves 3. Onahama, pan.**—*Author's abstract.*

12M–547 551.556.8:551.466.3
Walden, Hans, **Bemerkungen zu einer von Djounkovski und Bojitch angegebenen ziehung zur Berechnung des Seegangs aus den Windverhältnissen.** [Notes on a relation scussed by N. N. Djounkovski and P. K. Bojitch (1959) for computing sea waves from wind nditions.] *Deutsche Hydrographische Zeitschrift,* Hamburg, 12(6): 259–262, Dec. **1959.** figs., 9 refs., eq. English, German and French summaries p. 259. **DWB, DLC**—The equation

$$2h = \frac{0.33w}{\left(1 + \frac{0.7w}{D}\right)}\left(1 + \frac{1.86}{t}\right)$$

ich the author attributes to Von Makkawieff is used by Djounkovski, N. N. and P. K. jitch (1959) for computing the heights of sea waves. Graphic comparison with the work of erson-Neumann-James; Suthons-Bracelin-Walden; Darbyshire (1955), Darbyshire 952), is shown and the broad differences are briefly examined. *Subject Headings:* **1. Wave ight computations 2. Wind effects on waves.**—*E.Z.S.*

12M–548 551.501.3 551.556.8:551.466.34
Walden, H., **"Windsee entspricht nicht der Windstärke": Bemerkungen über die Bezieh-gen zwischen Beaufort-Skala und Seegangsskala.** ["Wind sea does not correspond to wind ce": notes on the relation between Beaufort scale and swell scale.] *Wetterlotse,* Hamburg, . 138:241–245, Nov. **1958.** **DWB**—The Beaufort scale was intended for sailing ships and es not conform to modern shipping needs, even the German originated (1939) state-of-sea scale d the nautical state-of-sea scale which largely is based on wave heights are quite satisfactory cause of departures from the normal. As classified and described here (1) when roughness the sea is lower than expected from the wind force and (2) rougher than expected. In both ses it has been observed that it is the temperature that is responsible. When the close-to-surface er of the air over a sea surface is warmer than the water, the sea is calmer than wind force licates and vice versa. It is suggested that wind driven sea and swell be indicated in terms of ght in m, periods in sec which form long time have been used by weather ships. *Subject adings:* **1. Beaufort scale 2. Ocean swell measurements.**—*W.N.*

12M–549 551.556.8:551.466.7:525.6
†Watts, I. E. M., **Effect of meteorological conditions on tide height at Hong Kong.** *ng Kong. Royal Observatory, R. O. Technical Memoir,* No. 8, **1959.** 30 p. 14 figs., 5 tables, refs. **DWB** (M551.46 W348ef)—The seven factors that affect tide height and the statistical ations of wind and tide, wind and storm surge and other meteorological factors in connection h the tide height at Hong Kong from 1951 through 1957, are discussed. The daily vector an winds and the average daily high tides in 1957 are tabulated and discussed. *Subject Head-s:* **1. Tide height data 2. Wind effects on tides 3. Hong Kong.**—*N.N.*

12M–550 551.556.8:551.466.41
Weenink, M. P. H. and Groen, P., **A semi-theoretical semi-empirical approach to the oblem of finding wind effects on water levels in a shallow partly-enclosed sea, Pt. 1–2.** otostat of separated pages 198–213 [*Netherlands. Meteorologisch Instituut, Mededeelingen en rhandelingen?*], *Ser. B,* **1958.** 3 figs 14 refs., eqs. **DWB** (551.46 W3971se)—A study is

made, using the method of successive approximation, of the effects of non-stationarity of wind c water levels in a shallow partly enclosed sea, such as the Strait of Dover. Formulas derive here, although modified, are from the general equation of fluids in motion. Outlines the "lea capacity" of the Dover Basin. *Subject Headings:* **1. Wind effects on shallow water 2. Win effects on water level 3. Strait of Dover.**—*N.N.*

12M–551 **551.556.8:551.466.34:532.5**

Wickham, J. B. (*USN Postgrad. School, Monterey, Calif.*), **Spectra of sea and swell o the California coast.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints abstracts of papers.* Issued Wash., D. C., AAAS, **1959**. p. 787–788. table. French summa p. 788. **DWB** (551.46082 I61pr)—The investigation briefly reported here was designed to estima the magnitude of the attenuation term associated with the wind-produced ocean swell. For th purpose the energy-density spectra of the waves at two locations were determined. The spectru at one location was determined from the wind field, assuming NEUMANN's spectrum, and for t other location, wave records from pressure meters in shallow water were analyzed by Tukey method. Ratios of inferred to observed energy density are tabulated. The difference between t observed spectra and those inferred from the wind field represent the measure of attenuatio *Subject Headings:* **1. Wave spectra 2. Swell spectra.**—*I.S.*

12M–552 **551.46:551.542:551.552/3(262.**

Zemliakov, V. M., **Atmosfernoe davlenie i veter nad Chernym morem.** [Atmospher pressure and wind over the Black Sea.] . *Kiev, Ukraine. Nauchno-Issledovatel'skiĭ Gidrome orologicheskiĭ Institut, Trudy,* No. 7:183–195, **1957.** 11 figs., 2 refs. **DWB**—A study of ba data is made. From observations made during the period of 72 years (1881–1953) only 20,3 were used, due to unreliability of many observations made on board ships. The factors, perio and nonperiodic, that have an influence on the atmospheric pressure are considered. Grap indicating yearly changes in pressure are given. Average monthly pressure in isobars are sho and discussed; they are for the months of Jan., May, July and Oct. The wind regime is d cussed and analyzed in great detail. Schematic charts of Black Sea with wind roses, isolines mean monthly wind velocities for Jan. and July are included. *Subject Headings:* **1. Atmospher pressure over the sea 2. Wind effects on water 3. Black Sea.**—*B.J.G.*

STORM SURGES

12M–553 **551.515.2:551.466.327 551.46**

*Balay, Marciano A. (*Naval Hydrographic Serv., Buenos Aires*), **Causes and periods of t "great storm surges" in the River Plate.** *International Oceanographic Congress, 1st, N. 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 737–740. 2 fi In English and Spanish. **DWB** (551.46082 I61pr)—That the occurrence of "storm surges" o catastrophic nature in the River Plate is common at certain periods is shown by a graphic presen tion of the observations made since 1905. An analysis is presented of various concurrent fact relating to the "great storm surges" for the purpose of forecasting for longer and shorter perio *Subject Headings:* **1. Storm surges 2. Río de la Plata, Argentina.**—*I.S.*

12M–554 **551.509.59:551.515:551.461.2:551.466.**

Harris, D. Lee (*U. S. W. B., Wash., D. C.*), **Some problems involved in the study storm surges.** (In: Caribbean Hurricane Seminar, Ciudad Trujillo, Feb. 1956, **Final Rep of the Seminar,** pub. **1956.** p. 306–327. 8 figs., 27 refs., 7 eqs.) **DWB**—The development reliable techniques for forecasting storm surges requires an examination of the changes in level and factors which determine sea level as a function of time and space. A discussion of normal causes of change. Studies are under way, hoping to establish a sound basis for forecast surges. *Subject Headings:* **1. Storm surge forecasting 2. Storm surge research.**—*E.Z.S.*

12M–555 **551.515.2:551.461.327:551.46**

Ichiye, Takashi, **On the secondary undulations caused by the typhoon "5415," Pt. 2, T characteristic properties of oscillations at each station (Researches on the storm surge, II** *Oceanographical Magazine,* Tokyo, 8(2):107–122, Dec. **1956.** 27 figs., 2 tables, 8 refs., 8 **DWB, DLC**—The characteristic properties of oscillations are described individually for each tion and graphically represented. They are considered with respect to the change of amplitu corresponding to the meteorological conditions, the modes of oscillations and their periods with respect to methods for estimating them. Numerous graphical representations and tabulati are included. The histogram of periods of oscillations, their spectrum for each station and the mareograms and topographic charts for each station are shown. The median and quanti determined from the frequency distributions and the computed values of the period are tabula is concluded that generally the oscillation of the bays with a narrow mouth or the narrow bay regular with definite periods close to the computed values with formula of Merian, whereas se on the open coast or of the wide bays are complicated with different kinds of periods, and are affected by meteorological conditions. *Subject Headings:* **1. Storm surges 2. Oscillation bays.**—*I.S.*

12M–556 551.515.1:639.2:551.46(261)

*Mertins, Hans Otto, **Die Sturmhäufigkeit auf den Fischfangplätzen im Jahre 1956.** [Storm quencies on fisheries in 1956.] *Wetterlotse,* Hamburg, No. 116:89–97, April **1957.** 4 tables. **C**—In 1956 German high sea fishery was less productive than 1955. The cause is being in- tigated by the "Anton Dohrn." One possible cause was storminess. Numbers of hours with ce ≥ 8 are tabulated monthly for 17 fishing places in Iceland region, Barents, Lofoten and rth Seas. Iceland (except SE) was stormier than in 1955 and generally more than the average 1950–54. Lofoten was less stormy in 1956 than 1955. North Sea was very stormy in 1956 gures for 1955 not available). *Subject Headings:* **1. Storm frequencies 2. Fisheries 3. rth Atlantic.**—*C.E.P.B.*

12M–557 551.576.1:551.515.2 551.466.34:532.593:551.515.2

Millas, José Carlos, **Cloud motions and sea swell in hurricane detection and analysis.** : Carribbean Hurricane Seminar, Ciudad Trujillo, Feb. 1956, **Final Report of the Seminar, b. 1956.** p. 109–121. 11 refs.) **DWB**—A discussion of practical visual techniques in detect- precursory signs of approaching hurricanes. Father Benito Viñes' work on general law of lonic currents at different levels has been helpful. The second law of Viñes is, however, plicable only to giant and normal class cyclones. Bands of high clouds, which are parallel do ve a point of convergence and according to Viñes the focus of convergence indicates approxi- tely the bearing of the center of the hurricane. In some cases there is a deflection toward the ht. Particulars on methods of cloud observations are explained. Change in the state of the and an incoming swell may suggest direction and distance of a well developed normal or giant ricane. *Subject Headings:* **1. Hurricane detection 2. Sea swell.**—*E.Z.S.*

12M–558 551.466.327

*Miyazaki, Masamori (*Kobe Marine Obs.*), **Storm surges at the Kobe Harbor, Pt. 1.** *eanographical Magazine,* Tokyo, 7(1):11–19, June **1955.** 2 figs., 5 tables, 3 refs., 17 eqs. **C**—On the basis of tidal records from 1925 to 1954, the paper discusses the mechanism of the rm surges at Kobe Harbor. The study uses a synoptic approach. The statistical characteristics surges, the correlation among surge profile, typhoon routes and features, and the experimental predicting the maximum height of surges are investigated. Storm surges at Kobe, their ual frequency, total number in calendar month and classification are tabulated. *Subject Head- s:* **1. Storm surges 2. Typhoon trajectories 3. Storm surge frequencies 4. Kobe, Japan.** *.S.*

12M–559 551.515.2:551.556.1:551.466.38:551.468.1

New Jersey. Legislature, Commission to Study Sea Storm Damage, **Report of the . . . mmission.** Dec. 1, 1955. 8 p. **DWB** (M15.2 N532r)—A detailed analysis of financial losses damage suffered by 54 towns in 5 counties of New Jersey during one storm (Nov. 6–7, 1953). mage to highways, sidewalks, boardwalks, sewers, buildings, equipment and property totalled 842,493. Most towns could hardly afford to pay for repairs without heavy borrowing, which many cases would be illegal. In addition, the 1954 hurricane resulted in $6 to $10 million nage along the New Jersey beaches. It is recommended that the state bear half of the costs repairs for damage caused by the storms. *Subject Headings:* **1. Storm damage 2. Hurri- ie damage, New Jersey 3. New Jersey.**—*M.R.*

12M–560 551.515.2:525.6(52–11):551.466:551.465.755

Seki, S., **On the storm tides in Suruga Bay and Tokyo Bay caused by the typhoons orgia (No. 5907) and Vera (No. 5915).** *Journal of Meteorological Research,* Tokyo, 12(4): –252, April **1960.** 11 figs., 9 tables. In Japanese. **DWB, DLC**—On Aug. 14, 1959 Typhoon eorgia) No. 5907 reached the Bay of Suruga: with central pressure at 995 mb, wind speed at n/sec ranging 60 km/hr max. It caused high tide in various areas: Kozensaki, 40 cm; hiura, 41 cm; Shimizu Harbor, 72 cm; Yokohama, 48 cm and Tokyo, 78 cm. The tidal condi- n, as well as meteorological tide, air pressure and winds, is mapped within the individual area. second part of this paper deals with Typhoon (Vera) No. 5915 which reached Ise-bay on t. 22, 1959, with average pressure at 930 mb above. A detailed description on the tidal phe- nena at each area is given and shown in tables. *Subject Headings:* **1. Typhoon effects on levels 2. Japan.**—*K.C.*

APPLICATIONS

12M–561 551.509(26) 551.501.3:551.

Canada. Meteorological Division, **Use of the Beaufort weather notation in marine met**
orological observations. Its *CIR*-2418, OBS-201, Jan. 12, **1954.** 16 p. **DWB**—Extensi
tables give Beaufort symbols which may be used for most of the 100 types of weather in t
WMO, *WW* code for present (or past) weather. The Beaufort symbols are widely used
ships logs, as they are more versatile than the number code (more specific and can indicate tv
kinds of weather occurring simultaneously). The equivalents for the *WW* numbers for 00 to
are given in a table, wherever applicable. *Subject Headings:* **1. Marine meteorological cod**
2. Beaufort weather symbols 3. WMO *WW* code.—*M.R.*

12M–562 551.582.3:551.465.

*Great Britain. Meteorological Office, **Climatological and sea-surface current charts of t**
North Atlantic Ocean, January–December, issued 1957–1958. 12 charts fold. (in colo
40″ × 26″. Price: 3 sh. each. (*M. O.* 615/1–12.) "Content of the charts based upon observ
tions received from British selected ships between 1855 and 1939." **DWB?**—The charts repr
sent one of a series based on observations received from selected British ships btween 1855 a
1939, the series is to be prepared for the North Atlantic, South Atlantic, Indian, North Paci
and South Pacific Oceans. The climatic and sea surface current charts show the currents duri
the quarter beginning with the respective month, the wind roses for the months, and approxima
mean (1920–1939) limit for pack ice. Maps consisting of isopleths for scarce observations a
included. Normal steamer tracks are also shown on the maps. *Subject Headings:* **1. Curre**
charts 2. Wind roses 3. Ship tracks 4. North Atlantic Ocean.—*O.T.*

12M–563 551.46(084.3) 551.552(26):9

Markgraf, H., **Die erste Windkarte der Weltmeere.** [The first wind chart of world ocean
Wetterlotse, Hamburg, No. 143:70–72, March **1959.** 2 figs. Also: **Windkarten der Weltmeer**
eine geschichtliche Betrachtung. [Wind charts of world oceans: a historical note.] *Ibi*
No. 144:73–78, April **1959.** 3 figs. **DWB**—Halley's first wind chart of the oceans is descri
and reproduced in the first of the two articles, while the evolution of maritime charts is shown
an appraisal of Maury's efforts, Köppen's **Selhandelbuch**, the activity of the Deutsche Seewa
and of the Seewetteramt, by the U. S. **Atlas of climatic charts of the oceans** in 1938 (*see* 5
107, Jan. 1954, *Met. Abs.*) and finally the Russian **Morskoĭ Atlas**, 1953 (*see* 11A-6, Jan. 19
Met. Abs.). The value of the 20 million ship observations of the Seewetteramts, collected si
the foundation of the Deutsche Seewarte, is emphasized. Samples of these important sea cha
are reproduced. *Subject Headings:* **1. Halley's wind chart of oceans 2. Atlas of Clima**
Charts of the Oceans 3. Morskoĭ Atlas 4. Marine atlases.—*O.T.*

12M–564 551.46(084.3) 551.509.2(2

McCarthy, Brian, **Plotting and analyzing ocean weather maps.** *Mariners Weather L*
Wash., D. C., 3(6):227, Nov. **1959.** **DWB**—A letter by Brian McCarthy, Third Officer of
S.S. "Cape Ann," illustrating the practical value of plotting and analyzing ocean weather ma
by an example used on one of his own ships. In Jan. 1959 the S.S. "Cape Ann" departed fr
Vancouver for Yokohama. Due to the preliminary analysis of ocean weather maps, in spite
two weather calamities, the ship suffered no structural damage or loss of cargo and arrived saf
in Yokohama 23 days after departing from Vancouver. *Subject Heading:* **1. Ocean weat**
maps.—*I.S.*

12M–565 551.509.1(

Netherlands. Meteorologisch Instituut, **Voorschriften voor het bijhouden van het me**
orologisch journaal, Druk 1947. Toelichtingen voor het verzenden van het internation
scheepsweerrapport. Codes voor het internationaal scheepsweerrapport. Correctieherle
ings- en psychrometertabellen. [Instructions for the preparation of the meteorological
1947 edition. Specifications for sending International Ship Weather Reports. Codes for Int
national Ship Reports. Corrections, conversion and psychrometric tables.] Its *Pub.* No.
1947. 48 p. 15 codes, 8 tables. **DWB**—Standard 1947 edition International Ship Code inst
tions in a Dutch edition. *Subject Headings:* **1. International Marine Codes 2. Dutch l**
guage.—*M.R.*

12M–566 551.501.1(

Prager, E., **Soll ein Beobachter "pütscherig" oder "grosszügig" sein?** [Should an obse
be meticulous or rough?] *Wetterlotse,* Hamburg, No. 101:105–111, June **1956.** **DLC**—
international weather code seems complicated and pettifogging to a ship's officer. The reas

r this need for exactitude and completeness are explained, but many observers strive overmuch r exactitude, e.g., by interpolating fractions of Beaufort force numbers. Reporting visibility d cloud presents difficulties; other examples are given. *Subject Heading:* **1. Marine observa-on.**—*C.E.P.B.*

12M–567 551.501.1:551.509.2:551.46

Rodewald, Martin, **Wie zeichne ich gute Bordwetterkarte?** [How do I draw a good ip weather map?] *Wetterlotse,* Hamburg, No. 138:245–253, Nov. **1958.** 3 figs. **DWB**—It is ot necessary to be an artist to draw a ship's weather map if one uses the technical tricks and ore cuts given here. Includes some do's and don'ts that would be well to remember. *Subject eadings:* **1. Weather maps 2. Ship weather maps.**—*W.N.*

12M–568 551.509:378(26):551.46(084.3)

Seilkopf, H., **Übungswetterkarten Nordatlantik/Europa.** [Training weather charts, North tlantic/Europe.] *Wetterlotse,* Hamburg, No. 97:30–31, Feb. **1956.** **DLC**—Remarks on teach-g the plotting and use of weather charts on board ship. *Subject Heading:* **1. Training in arine forecasting.**—*C.E.P.B.*

12M–569 551.465.52:551.582.3(26)

*Great Britain. Meteorological Office, **Monthly meteorological charts and sea surface cur-nt chart of the Greenland and Barents Seas.** *Prepared in the Marine Branch.* 2nd ed. ondon, Her Majesty's Stationery Office, **1959.** Unpaged. Entirely charts. (*M.O.* 575, formerly *.O.M.* 402B) Price: 6£ 6sh. "Intended to be a continuation of the **Monthly meteorological arts of the Atlantic Ocean.**" (*See* 5A-97, Jan. 1954, *Met. Abs.*) **DWB**—"Meteorological arts for each month on Mean air temperature; Mean sea temperature; Fog; Fog, mist and haze; ean cloud amount; Cloudiness; Precipitation; Snow; Mean barometric Pressure; Frequency of inds, Beaufort Force 0–4; Predominant direction and constancy of surface winds; Frequency gales; Frequency, force and direction of wind; Frequency, amount and direction of swell. ata in most cases cover periods 1854–1914 and 1920–1950." This atlas represents the fifth of e set of monthly meteorological charts of the main oceans of the world. Like the previous olumes on the Atlantic, the Western and Eastern Pacific and the Indian Ocean, it deals com-ehensively with the climatology month by month, intended as a continuation of the volume on e Atlantic Ocean. Based on the available relevant observations sent into the Meteorological ffice of the British Air Ministry, and supplemented by several other sources, much less data were vailable for this area than for the main oceans, and no meteorological information is shown r the areas of the Baltic and White Sea included in the charts. All available observations of ind, air and sea temperature, cloud amount and weather were used for the periods 1854–1914 d 1920–1950. Swell observations were only available for 1921–1939 and 1945–1948. The arts for each month represent the mean air temperature; the mean sea temperature; fog, mist d haze; mean cloud amount; cloudiness of three proportions; precipitation; snow; mean baro-etric pressure; frequency of winds of Beaufort Force 0–4; predominant direction and con-ancy of surface winds; frequency of gales; frequency, force and direction of wind; frequency, mount and direction of swell. An annotated sea surface current chart supplements the monthly arts. Explanatory notes are provided for each chart. The 30°F isotherm of mean sea surface mperature represents the approximate probable mean position of the limit of the sea ice-field the middle of each month. Conforming to the previous atlas volumes of the set, all the charts f the present volume show the data by isopleths but wind and swell data are illustrated by roses. *ubject Headings:* **1. Climatic charts 2. Marine atlases 3. Greenland Sea 4. Barents Sea.** -*O.T.*

12M–570 551.5(26)(02):551.46(084.3)

U. S. Weather Bureau, **Preparation and use of weather maps at sea: a guide for mariners.** th ed. Its *Circular R,* issued **1959.** 121 p. figs., photos, tables, forms. Price: $1.25 from ov. Print. Office. (For abstract on 3d ed., 1949, *see* 9–12 and 5A–160, Sept. 1950 and Jan. 954, *MAB.*) **DWB** (M01.1 U587c R-1959)—The last 10 years, since the publication of the d edition of **Circular R**, have witnessed the development and application of radar for routine bservation of hurricanes and their movements, and the practical application of modern synoptic ethods of wave forecasting. These two innovations have been incorporated in the text of the th edition of **Circular R** so that it is an up-to-date manual for map analysis and forecasting, and guide to methods of bad-weather avoidance for ships at sea. Weather maps are necessarily mple and confined to the surface charts, but preparation of supplementary maps of wave condi-ons are added to the instruction, also sample synoptic charts of North Atlantic and North Pacific, list of textbooks and manuals for further study, and a glossary of marine meteorological terms are added in this edition. Coding and decoding message station models, drawing isobaric tropica as well as extratropical storms and wind bulletins for shipping, use of weather maps is include *Subject Headings:* **1. Marine meteorology manuals 2. Wave forecasting charts.**—*M.R.*

12M–571 551.509.21(26):551.46(084.3

§Hay, R. F. M., **Weather charts plotted at sea.** *Marine Observer,* 26(171):33–36, Jan. 195 2 figs. **DWB**—A synoptic chart for April 10, 1955, drawn on board ship is compared with on drawn in the Marine Division. A few discrepancies are discussed. *Subject Heading:* **1. Shi weather maps.**—*C.E.P.B.*

12M–572 551.5:656.61(261

Rodewald, Martin, **Eine Lanze für den Südweg.** [A lance for the southern route.] *Wette lotse,* Hamburg, No. 60:166–169, Aug. **1953.** fig. **DWB**—A brief letter explaining that as a alternative to the usual routes, the "Greystoke Castle" sailed from the English Channel to the S Lawrence along the southerly route. The ship experienced satisfactory weather and steaming co ditions. During the time of passage from the Azores to Cabot Strait bad weather prevailed up i the north; thus, had the vessel been set on the great circle to Cape Race, she would have bee buffeted and delayed. *Subject Headings:* **1. Marine navigation 2. North Atlantic navigatio 3. North Atlantic Ocean.**—*E.Z.S.*

12M–573 621.396.7(26):551.46:551.5:061(26

Buhr, Joachim, **Wetterfunkerfahrungen der Bordwetterwarte des Fischereiforschung schiffes "Anton Dohrn" im Nordmeer.** [Radio weather experiences on board the fishery in vestigation ship "Anton Dohrn" in the North Sea.] *Wetterlotse,* Hamburg, No. 120/121:160 169, July/Aug. **1957.** fig. **DLC**—Up to March 13, 1957 the "Anton Dohrn" made 19 observa tion voyages. The observations of ships nearby are collected and issued in 2 parts: 1) Arcti Barents Sea, North Sea and 2) North Atlantic, Iceland and Greenland. Details of code an transmissions are given. Observations can be relayed from Weather Ship "Polar Front" Norwegian stations on Jan Mayen, Bear Island or Spitsbergen. *Subject Headings:* **1. Radi weather transmission 2. Marine weather services.**—*C.E.P.B.*

12M–574 551.5:621.315.28:551.4

Betson, J. P. F., **Weather and sea conditions in connection with cable laying.** *Mari Observer,* London, 26(172):95–96, April **1956.** 2 figs. **DLC**—Technique of laying a telepho cable across the Atlantic is described by the commanding officer of the cable-laying ship "Monarch Working limits are wind force 7 with sea 5 and swell 5. *Subject Headings:* **1. Atlantic cab laying 2. Weather effects.**—*C.E.P.B.*

12M–575 551.5:061(26) 551.507.25:629.123(71

Canada. Meteorological Branch, **Canadian selected and supplementary observing shi as of Sept. 30, 1958.** Its *CIR*-3115; G-90, Oct. 22, **1958.** 4 p. **DWB, DLC**—Gives detai of commercial ships which are cooperating with the Meteorological Department on a volunta basis. There are 58 ships on the list. The names of the ships and the instruments used them are itemized. *Subject Heading:* **1. Marine weather services.**—*A.H.K.*

12M–576 551.509.1(26):551.5:06

§**Dunstable's appreciation of a detailed report from a ship.** *Marine Observer,* Londo 27(178):230–232, Oct. **1957.** fig. **DLC**—At 0600 June 11, 1957, a depression with estimate central pressure of 994 mb was centered in 55°N 28°W. This proved to be an error. It explained why the forecaster at Dunstable was sceptical. *Subject Heading:* **1. Ships' weath messages.**—*C.E.P.B.*

12M–577 551.507.2(261):551.5:06

Frankcom, C. E. N., **British Ocean Weather Ships: 10th anniversary.** *Meteorologic Magazine,* London, 86 (1024):304–306, Oct. **1957.** 4 photos, 3 refs. **DWB**—On Aug. 1, 194 "Weather Observer" sailed from London on her first voyage as O.W.S. to station "Juliett" (5 30′N, 20°W). Others followed in Oct. and Nov. 1947 and Feb. 1948 Photos and observi routine are given. *Subject Heading:* **1. Weather ships.**—*C.E.P.B.*

12M–578 551.5:061(26

Canlas, Dominador C., **Influence of weather on shipping.** *Philippines. Weather Burea The Elements,* 3(9):9–10, Sept. **1952.** **DWB**—The Philippine Weather Bureau's activities respect to marine meteorology are: 1) dissemination of marine forecasts and storm warnings radio and visual signals, 2) direct contact with merchant ships through liaison officers of t arine Unit at the Weather Bureau and 3) furnishing literature on marine meteorology to utical schools. *Subject Headings:* 1. **Marine meteorology** 2. **Philippine Weather Bureau.** *G.T.*

12M–579 629.12:551.46.086

†Cartwright, D. E. (*Nat. Inst. of Oceanog., Eng.*) and Rydill, L. J. (*Royal Naval College, eenwich*), **The rolling and pitching of a ship at sea; a direct comparison between calculated d recorded motions of a ship in sea waves.** *Institution of Naval Architects, Transactions,* :100–135, **1957.** 23 figs., 39 refs., eqs. **Discussion** p. 130–135. Reprinted in *National In- tute of Oceanography, Wormley, England, Collected Reprints,* 5(171), **1957.**—An analysis is ade of the relation between the rolling and pitching of a ship (R.R.S. "Discovery II") at sea d the waves recorded simultaneously by a shipborne wave recorder. Most of the observations re made with the ship steaming at 6½ knots on a series of 12 courses in a long-crested wave stem, but good results were also obtained with the ship head-on to short-crested storm waves. e method is based primarily on spectral analysis by means of an automatic Fourier analyzer, t an important extension is made to show the connection between the spectra of ship motions d their statistical properties. The practical results are simple to apply, and advanced methods ich estimate some terms with greater precision but at the cost of greater computational labor. e theoretical results are in general quite close to, and never very different from, the practical sults, the differences largely being due to statistical variations. Attention is drawn to the fact, ten not realized, that all measurements at sea are subject to considerable statistical errors which n only be reduced by increasing the duration of recording. This does not matter for the purpose prediction, but it is important in the interpretation of records. *Subject Headings:* **1. Ship otion due to waves 2. Ship motion spectra 3. Wave recording.**—*Authors' abstract.*

12M–580 551.5:629.123:527

Cooperman, Arthur I., **Meteorological and oceanographic navigation.** *Mariners Weather g,* Wash., D. C., 1(1):7–8, Jan. **1957. DWB**—Wind and wave forecasts can save time and oney and weather forecasts can prevent untold damage to ships and cargoes. In 1954, out of thousand power vessels of > 500 tons, > 1000 suffered heavy damage, 30 were wrecked and st, 976 were stranded and 670 involved in collisions. A case is cited where 2 ships left Europe multaneously for New York and travelled the same distance, but the one, which was routed cording to anticipated weather (from France) arrived 67 hours ahead of the one from Liverpool at followed the fixed route. *Subject Headings:* **1. Meteorological ship navigation 2. Weather mage to ships 3. North Atlantic.**—*M.R.*

12M–581 551.524:910.45(261)

Creasi, V. J. (*U. S. W. B., Wash., D. C.*), **Weather and Atlantic Ocean travel.** *U. S. eather Bureau, Weekly Weather and Crop Bulletin,* 43(25):7–8, June 18, **1956. DWB, DLC, A**—The average air temperature over the Atlantic Ocean in May is 60°F (spring); summer is e best time to cross the North Atlantic. Autumn months are pleasant but are windy and ugher towards the end of the season. Summer months over the South Atlantic have pleasant eather also. Air temperature varies from 50°F (Buenos Aires) to 77°F northeast of Cape int Rogue, South America to Africa in Sept. *Subject Headings:* **1. Marine weather condi- ons 2. Atlantic navigation weather 3. Atlantic Ocean.**—*N.N.*

12M–582 551.507.22(44)

Frankcom, C. E. N., **A new French weather ship.** *Marine Observer,* London, 29(186):197– 9, Oct. **1959.** map. **DLC**—The French weather ships, the "Mermog" and "Le Verrier," have en replaced by the "France I" and the "France II," after 12 yrs in the Atlantic international et. The latter were placed in service in Feb. and May, 1959, respectively, Both of them are out 243 ft long, 40 ft wide, 16 ft deep and a maximum speed of 15 knots. They are well built, ceptional in equipment, and are designed for all types of weather work, including radio sonde d radar wind observations. *Subject Headings:* **1. Weather ships 2. France.**—*N.N.*

12M–583 551.584.6:629.123.4

Höller, E. (*Marine Wea. Bu. of the German Met. Service*), **Cases of damage to cargoes d their meteorological significance.** (An extract from his **Schädensfälle and Ladungsgut d ihre meteorologische Deutung.**) (For abstract on original, *see* 8.4–76, April 1957, *Met. bs.*) *Marine Observer,* London, 29(183):19–25, Jan. **1959.** 4 figs. **DWB, DLC**—The report scribes a few examples of cargo damage familiar on German and foreign ships in relation to eteorological conditions during the course of the voyage and to ventilation measures taken or t taken from 1952 through 1955. *Subject Headings:* **1. Cargo damage 2. Marine mete- ology.**—*N.N.*

12M–584 629.12:639.2:551.46.(

Hempel, Gotthilf (*Biologische Anstalt Helgoland*), **FFS "Anton Dohrn" zwei Jahre i Dienste der Meeresforschung.** [The fishery research vessel, "Anton Dohrn," two years in tl service of ocean research.] *Naturwissenschaftliche Rundschau,* Stuttgart, 10(12):458–460, De 1957. fig. **DWB, DLC**—The principal investigations carried out by the fishery research vess "Anton Dohrn" during the 2½ yrs since it was put into service, are described. These include the distribution of warm and cold water masses, the direction and velocities of currents betwee Iceland and Greenland, chemical and aerological characteristics of this area, hydrographic co ditions separating the European North Sea from the Atlantic Ocean, the study of "internal waves and the water exchange between the coastal ocean of the North Sea and the open sea, the effe of water temperature in this area, salt content and currents upon fish population, biology of fis population, etc. A map shows the investigation areas of the "Anton Dohrn." *Subject Heading* **1. "Anton Dohrn" 2. Fishery research voyages.**—*I.L.D.*

12M–585 551.466:532.59:629.12(261

Holcombe, R. M.; MacDougall, G. H. and Perlroth, I. (*all, Div. of Oceanog., U. S. Na Hydrographic Office*), **Appraisal of minimum time tracks based on wave conditions.** *Marine Weather Log,* Wash., D. C., 3(1):1–4, Jan. **1959.** 3 figs., 4 refs. **DWB**—Based on observe wave conditions over the North Atlantic during the past three years, reasonably accurate estimat were obtained of minimum time track and sailing hours gained vs. the great circle route. Tl calculations are based upon a C-4 type vessel cruising at 17 knots through 4 ft high waves. Plo of the distribution of east-bound and west-bound minimum time sea courses for February betwe Nantucket (U. S.) and Lands End (Britain) show that 80% and 90%, respectively, lie north the great circle route. Graphical and tabulated data on mileage or hours of expected gain a given. *Subject Headings:* **1. Sailing time tracks 2. Navigational aids 3. North Atlanti** —*W.N.*

12M–586 551.507

International Civil Aviation Organization, **Protocol extending the period of the Agreeme of May 12, 1949 on North Atlantic Ocean Weather Stations, Montreal, May 28, 1952.** *Gre Britain. Foreign Office, Treaty Series,* No. 43, 1953. 5 p. In English, French, and Spanis (*Great Britain, Parliament. Papers by Command,* No. 8884) **DLC** (JX636 1892, 1953)- *Subject Headings:* **1. Ocean weather stations 2. Treaties.**

12M–587 551.46.065:656.6.(

Japan. Hydrographic Department, **Honpo Kisen Zasho Tokei-Zu-Nihon Kinkai.** [St tistical maps of wrecked or sunken Japanese steamships in the area of Japan.] **1934.** 27 plat with text. **DLC** (Orientalia, Japanese, Uncat)—For the 26 year period, 1897–1930, 1072 wreck or sunken Japanese steamships (larger than 100 gross tons) were catalogued and mapped on divisions in the Japanese area. On these charts, the position, course and the date of wrecka or sinking of these ships, state of sky, wind direction and speed, at the critical period are note There are also short remarks on each case. *Subject Headings:* **1. Marine disasters 2. Japa** —*H. Arakawa.*

12M–588 629.1

Jasper, Norman H. and Birmingham, John T., **Strains and motions of USS Essex (CVA during storms near Cape Horn.** *U. S. David W. Taylor Model Basin, Caderock, Md., Repo* 1216, Aug. **1958.** 31 p. 11 figs., 2 tables, 5 refs., eq. **DWB** (623.81 U582st)—Strains, sh motions, and wave heights were measured during a passage of USS "Essex" (CVA 9) arou Cape Horn in very rough seas. The results of the measurement on the "Essex," together wi the damage sustained by "Ticonderoga" (CVA 14) during a similar passage, indicate that t buckling strength of portions of the hanger deck (uppermost strength deck) is inadequate. T measurements show that hull stresses associated with intermittent whipping in the first flexur mode were much larger than hull-bending stresses induced at the frequency of wave encount The analysis indicates that the whipping motions are primarily caused by hydrodynamic forc associated with the immersion of the bow flare. The report recommends strengthening of t main-deck longitudinals and consideration of whipping stresses in ship design. *Subject Heading* **1. Ship stability 2. Cape Horn, Chile.**—*Authors' abstract.*

12M–589 551.509.21(267:676):551.46(2

British East Africa weather services to shipping in the Indian Ocean. *Marine Observe* London, 26(172):111–112, April **1956.** **DLC**—Communication from Director of East Afric Meteorological Department setting out radio bulletins from Nairobi for Indian Ocean eastward 65°E from 12–30°S. *Subject Headings:* **1. Weather broadcasting 2. British East Afri 3. Indian Ocean.**—*C.E.P.B.*

12M–590 656.6.08:551.575(261)

The Andrea Doria-Stockholm tragedy. *Mariners Weather Log*, Wash., D. C., 1(1):5, n., 1957. **DWB**—The first collision between 2 ocean liners on the high seas occurred in the g 20 mi SW of Nantucket at 11:20 p.m. on July 25, 1956 with a loss of 50 lives. A table ows mean number of days with fog (2¼ mile visibility) in 52 years at Nantucket. July has ghest (45% of days) and November lowest (10%) incidence of fog. This advection fog is ten patchy. *Subject Headings:* **1. Marine disasters in fog 2. Fog frequencies 3. North lantic Ocean.**—*M.R.*

12M–591 551.46:551.506(26)(09)

Lebenslauf der Seeobse. [Life history of sea observations.] *Wetterlotse*, Hamburg, No. 1:1–3, Jan. 1959. **DWB**—An account of marine observations and how they are reported, ocessed and distributed locally, nationally continentally and internationally through the existing ather networks. *Subject Heading:* **1. Marine meteorological observations.**—*W.N.*

12M–592 551.507.2:551.5:627.23:551.468

Mackay, J. Ross, **Notes on small boat harbors, N.W.T.** *Canada. Department of Mines d Technical Surveys, Geographical Branch, Geographical Paper*, No. 13, **1957.** 12 p. 7 figs. ice: 25 cents.—Supplementary information on the conditions in small boat harbors between ktoyaktuk and Cape Bathurst, N.W.T. are provided to augment the hydrographic charts for area. Coastal boats ranging from 20 to 40 feet in length and 2 to 5 feet in draught will bene- from this information. Weather conditions for the following harbors are described: Cape thurst, Baittie Islands, Harrowby Bay, Point Atkinson, McKinley Bay, Nicholson Peninsula d Warren Point. *Subject Headings:* **1 Harbor conditions 2. Coastal information 2. North- st Territories, Canada.**—*N.N.*

12M–593 551.509.52(26):551.46(084.3)

§Netherlands. Meteorologisch Instituut, **Informal meeting on meteorological problems, ncerning the North Sea: final report, DeBilt, Feb. 7–8, 1955.** [Issued **1955**? 117 p. figs., les. **DWB** (M:551.46 N469i)—Meeting on Feb. 7 and 8, 1955, at DeBilt was attended by representatives from Belgium, Denmark, France, Netherlands, Norway, Sweden, U.K. and est Germany. The agenda covered the observations network of the North Sea area, improve- nt in exchange of data, increase in number of reporting ships, coordinating storm warning vices for shipping, and evaluation of a fixed meteorological post in comparison with "selected p" reports. Many supporting papers, charts, tables, etc. are included in report. *Subject adings:* **1. North Sea storm warning service 2. Conference on North Sea storms 3. rth Sea area. I. Van Duijnen Montijn, J. A.**—*M.R.*

12M–594 551.509.1(26):49

Netherlands. Meteorologisch Instituut, **Weerrapporten (van schepen) en weerberichten or de scheepvaart (van landstations).** [Weather reports from ships and weather information shipping from land stations.] Its *Publication* No. 127, t-p. dated **1946.** Loose-leaf with re- ions as late as **1950.** Each section renumbered. figs., tables. In Dutch. **DWB**—Codes and tructions for marine observers on Dutch Weather Ships based on prewar codes, with amend- nts based on IMO resolutions passed at Washington, D. C., in Oct. 1947 effective Jan. 1, 1949. e main part of the manual is devoted to lists of radio stations broadcasting marine weather ormation, and the contents of these broadcasts (stations, material broadcast or area affected forecasts or warnings). *Subject Headings:* **1. Ships' weather messages 2. Dutch weather adcasts.**—*M.R.*

12M–595 551.5:656.61

Noat, J., **La navigation météorologique à la mer.** [Meteorological navigation at sea.] *Météorologie*, Paris, No. 38:113–150, April/June **1955.** 34 figs., 7 refs., eqs. English and nish summaries p. 113. **DWB**—Meteorological navigation is defined by its principal aims, : to avoid damage to ships by bad weather, to protect cargo and crew, to shorten the time of ssing and thus to obtain savings in fuel and other expenditures. The first part of the article ts the present methods of navigation as compared with meteorological navigation, and demon- tes that orthodromy very often is not the most profitable route. Thereafter are given the lts obtained in various foreign scientic observations on the influence of wind on the behavior the craft at sea, viz: permanent listing, drift and reduction of advancing speed. It is finally wn how these results can be practically used to determine the probable loss of speed on a en crossing and to evaluate the profit of avoiding a depression. The study ends with examples successful meteorological navigation. *Subject Headings:* **1. Marine navigation 2. Mete- logical effects on ships.**—*Author's abstract.*

12M–596 551.509.21(2

§Robinson, J., **Ship reports and the forecaster.** *Marine Observer,* 20(150):202–211, O 1950. 9 figs. **DWB**—A series of weather charts for North Atlantic, Feb. 4–5 and July 11– 1950, show the fundamental importance of ships' observations. (*Same item as* 2.2-32, Feb. 19 *Met. Abs.*) *Subject Headings:* **1. Marine meteorology 2. Synoptic charts 3. Marine da**

12M–597 551.506(26

Rodewald, M., **Erfahrungen einer Februar-Reise (1957) von Norfolk nach Reykjav** [Experiences of a Feb. 1957 voyage from Norfolk to Reykjavik.] *Wetterlotse,* Hamburg, N 119:145–150, June **1957.** 2 figs. **DLC**—Account of a small ship voyage on Feb. 22–March from Norfolk, Va., to Reykjavik in very stormy NE winds and drift ice. *Subject Heading* **1. Weather 2. North Atlantic.**—*C.E.P.B.*

12M–598 656.6.08:656.61:551:466.327:551.55

Rodewald, M., **Zum Kentern eines Fischkutters.** [Capsizing of a fishing cutter.] *Wett lotse,* Hamburg, No. 122:195–197, Sept. **1957. DLC**—On April 19, 1957, the "Dorothea" c sized and sank in a NW wind force 6–7. The nets had been hoisted on a 9 m mast. This w due to an "outsize wave." Statistically one in 1000 or 1½ would be 3 times normal height. *S ject Headings:* **1. Shipwrecks 2. Wave heights.**—*C.E.P.B.*

12M–599 551.5:551.46:061.1(0

Roll, H. U., **Aus der Jahresbilanz 1958 des Seewetteramtes.** [An annual account of Seewetteramt for 1958.] *Wetterlotse,* Hamburg, No. 142:17–33, Feb. **1959. DWB**—An eval tion of weather reports from the sea and of the manifold activities of the Seewetteramt, Hamb are presented. The report deals with weather observation service at sea, shipboard weather statio marine meteorology, marine climatology, special measurements, load space meteorology, app marine meteorology, oversea meteorology, and the International Geophysical Year. *Subject He ing:* **1. Marine weather services.**—*O.T.*

12M–600 551.5:656.61(2

Rowe, L., **The southerly route.** *Marine Observer,* London, 23(159):39–41, Jan. **1953. DWB**—Account of weather advantages of route England—St. Lawrence via Azores over north route. *Subject Headings:* **1. Marine navigation 2. North Atlantic.**—*C.E.P.B.*

12M–601 551.507.2(4

Rozhkov, L. P., **O rabote gidrometeorologicheskoĭ stantsii Tuapse.** [The work of Tuapse Hydrometeorological Station. *U.S.S.R. Glavnoe Upravlenie Gidrometeorologiche Sluzhby. Komitet po Provedeniiu MGG, Informatsionnyĭ Sbornik,* No. 4:109–110, **1957. D** —The Tuapse Marine Hydrometeorological Station of the Ukrainian Hydrometeorological ser will carry out, in connection with the IGY, meteorological and hydrological observations, al 100 mile sections from its location on the sea level with tide gage and tide recorder. The mi section is to be made with the vessel "Mgla" from Cape Kodosh. The direction of this sec coincides with one of the traverses of simultaneous hydrological surveys of the Black Sea car out during recent years. Ten hydrological stations will be established. The observations at t stations are to be made at standard depths up to 1000 m. In addition to observations of vert distribution of temperature, salinity and oxygen it is proposed to make observations of curr at anchoring stations and during drift (method of Makarov-Nansen) at horizons of 0, 5, 10, 50 and 100 m. Also pH and alkalinity at depths up to 300 m. are to be studied. *Sub Headings:* **1. Ocean weather stations 2. Tuapse, Ukrainian S.S.R.**

12M–602 656.6.08:551

Schindler, G., **Nochmals ein Schiffsunfall durch Sonnenuntergang.** [Another ship acci through sunset.] *Wetterlotse,* Hamburg, No. 108:239–240, Nov. **1956.** fig. **DLC**—June 1956, at 21 h 10 m in the Kiel Canal a ship traveling west fouled an obstacle not seen becaus the clearing of a strip of sky and reflection of the setting sun on the water. *Subject Headi* **1. Shipwrecks 2. Weather effects.**—*C.E.P.B.*

12M–603 620

Seĭfer, A. L., **Morskaia korroziia metallov.** [Marine corrosion of metals.] *Prir* Moscow, 44(12):78–79, Dec. **1955. DLC**—Results of prolonged studies of marine corrosio metals carried out at corrosion stations throughout the world, permit definition of four corro zones differing by the speed of corrosion progress and the character of the corrosion destruc They are: 1. Zone of marine atmospheric corrosion (1.5 m above the water line); 2. Zon riodic wetting near the water line; 3. The underwater zone and 4. The zone of the sea bottom. he author discusses the progress and the nature of the deterioration peculiar to each of these nes, as well as the use of protective coatings and the electro-chemical protection of the under- ater parts of ships and equipment. *Subject Headings:* **1. Marine corrosion of metals 2. orrosion prevention.**—*A.M.P.*

12M–604 551.513:551.46

§Seilkopf, H., **Wetter-Ereignis-Folgen auf See.** [Weather events and consequences at sea.] *er Wetterlotse*, Hamburg, No. 127:38–43, Feb. **1958.** 3 refs. **DWB**—This is an attempt to rrelate disasters happening at different locations at sea with atmospheric circulation. Some ecific cases are discussed in relation to the synoptic conditions mapped. *Subject Heading:* **1. arine disasters.**—*W.N.*

12M–605 551.506.22(26)(43)

SHIGY. [Ships International Geophysical Year.] *Wetterlotse,* Hamburg, No. 132:140– 1, July **1958.** **DWB**—Very brief note on the German contribution of some 100 ship reports id observations—diaries to the Ships International Geophysical Year as received by the German a Weather Service in the first half of the IGY. *Subject Headings:* **1. Oceanographic data IGY research data 3. IGY oceanographic data 4. Germany.**—*W.N.*

12M–606 551.5:527

Steinborn, E., **Wetterbedingte Schiffsunfälle und neue Wege zu ihrer Verhütung.** [Ship cidents due to weather and new countermeasures.] *Der Wetterlotse,* Hamburg, No. 124:231– 6, Nov. **1957.** fig. **DWB**—A break-down of the causes of ship accidents shows that during e last three years an average of 23 percent of the accidents occurred due to poor weather condi- ons, bad visibility and fog. The author discusses the possibility of reducing the number of cidents by improving the radar instruments. *Subject Headings:* **1. Weather at sea 2. Marine cident prevention.**—*A.M.P.*

12M–607 656.6

Sysoev, N. N., **Svobodnye dvizheniia zaiakorennogo sudna i metodika ikh ucheta.** [Free ovements of an anchored vessel and method of their registration.] *Akademiia Nauk SSSR. stitut Okeanologii, Trudy,* 5:35–45, **1951.** 8 figs., 10 refs. **DLC**—After having explained the uses, size and character of free movements of an anchored vessel which have to be discounted instrumental measurements of sea currents, the author presents a critical review of different ethods used for calculating these "proper movements" of the vessel. They are: the Nansen ethod of using several anchors; the R. Witting method of measuring the movement of an ichored vessel; the German method of calculation utilized during the Atlantic expedition 1925– 27 on "Meteor," and Soviet methods practiced during experiments of the ships "Altair" and 'itiaz" (the overall strain of the anchor cable registered by dynamograph). The paper is con- uded with the presentation of the author's own method (in collaboration with E. Kudinov) of easuring the movements by means of registering the angles of inclination of the anchor cable three or four points of its run with aid of specially designed self recorders (advancing—re- rrent movements) and systematic registration of the vessel's course by means of a course graph id self recording of the direction of the cable regarding the magnetic meridian (rotation move- ent of vessel). *Subject Heading:* **1. Ship motions.—A.M.P.**

12M–608 551.507.2

U. S. Weather Bureau, **Ocean station vessel meteorological records survey, Atlantic and acific.** Its *Key to Meteorological Records Documentation,* No. 2.3, **1956.** 63 p. 21 figs., 8 bles, 15 refs. **DWB**—Tables and maps show locations held at various times by Atlantic and acific weather stations between 1940 and 1952, and records available. The listing is complete r U. S. stations and contains all information that could be obtained for those maintained by her countries. *Subject Headings:* **1. Ocean weather stations 2. Weather ships 3. Atlantic cean 4. Pacific Ocean.**—*G.T.*

12M–609 551.556.8:532.593:551.466.3

*Unoki, Sanae (*Met. Res. Inst., Tokyo*), **Wave climate at the ocean weather stations Tango id Extra in the North West Pacific.** *Oceanographical Magazine,* Tokyo, 10(2):157–167, Dec. **58.** 5 figs., 6 tables, 2 refs., eq. **DWB, DLC**—The features of wave climate and the gen- ating source of high waves at two ocean weather stations Tango (29°N, 135°E) and Extra 9°N, 153°E) are statistically investigated based upon visual observations of wave height and riod, and of the scale and direction of wind waves and swell. The results are collected in veral tables and figures. *Subject Headings:* **1. Wave height and period statistics 2. Ocean**

Weather Station Extra 3. Ocean Weather Station Tango 4. Northwest Pacific.—*Autho abstract.*

12M–610 551.582(261.71):629.12:551.46(084.
Great Britain. Hydrographic Dept., **Newfoundland and Labrador pilot, Vol. 1, Co prising the south-eastern and southern coasts of Newfoundland from Cape Saint Fran to Cape Ray, including Saint Pierre and Miquelon; the Strait of Belle Isle and its a proaches; and the western coast of New foundland from Flower Island to Cape Ray.** 8 ed. London, **1951.** 451+ p. 46 figs. **DLC**—Includes the usual section on Climate and Weath p. 52–68, with charts for sea areas around Newfoundland showing gale frequency Jan., July, f July, Dec. and sea temperature Feb., May, Aug., Nov. Full climatic tables are given for Be Isle, Torbay, St. John's, Cape Race, Grand Bank, St. George's. *Subject Headings:* **1. Pi guides 2. Local climates 3. Newfoundland 4. North Atlantic.**—*C.E.P.B.*

12M–611 551.582(6):629.12:551.46(084.
Great Britain. Hydrographic Department, **Africa Pilot, Vol. 2, Comprising the west co of Africa, from Rio del Rey to Cape Hangklip; the islands in the Bight of Biafra; the islan of Ascension and St. Helena; the Tristan da Cunha group and Gough Island.** 10th London, **1951.** 49 + 382 p. 36 plates, tables. **DLC**—The section on **Climate,** p. 49–82, cludes the usual detailed climatic tables for ports and islands. *Subject Headings:* **1. Clima surveys 2. Marine navigation 3. West Coast of Africa.**—*C.E.P.B.*

12M–612 551.582(267,6):629.12:551.46(084.
Great Britain. Hydrographic Dept., **Africa pilot, Vol. 3, Comprising the southern a eastern coasts of Africa from Table Bay to Ras Hafun.** 11 ed. London, **1954.** 49 + 551 24 plates, tables. (*See* 3H-130, Aug. 1952, *Met. Abs.* for 9–10th ed.) **DLC—Meteorolo** p. 39–80 includes tables for selected coast stations. *Subject Headings:* **1. Marine climatolo 2. Sailing directions 3. East Africa 4. South Africa.**—*C.E.P.B.*

12M–613 551.582(74/5):629.12:551.46(084.
Great Britain. Hydrographic Dept., **East coast of the United States Pilot, Vol. 2, Co prising the east coast of the United States of America from Barnegat Inlet to Ca Canaveral.** 5th ed. London, **1951.** 401 p. 4 plates. Includes: **Meteorology,** p. xxviii-xli **Climate and weather, with climatic tables,** p. 30–50. *Subject Headings:* **1. Local climatolo 2. Marine navigation 3. East Coast of United States.**—*C.E.P.B.*

12M–614 551.582(416/417):656.6:551.46(084.
Great Britain. Hydrographic Dept., **Irish Coast Pilot.** 10th ed. London, **1954.** 43 + 5 p. 27 plates, tables. **DLC—Meteorology,** p. xxviii–xliii. **Climate,** p. 24–45 with the us climatic tables for coastal stations. *Subject Headings:* **1. Sailing directions 2. Climatolo 3. Irish Sea Coast.**—*C.E.P.B.*

12M–615 532.5:551.4
Bowden, K. F. and Fairbairn, L. A. (*Univ. of Liverpool, Oceanog. Dept.*), **Further obser tions of the turbulent fluctuations in a tidal current.** *Royal Society of London, Philosophi Transactions, Ser. A,* 244(883):335–356, March 4, **1952.** 9 figs., 5 tables, 10 refs., eqs. **DW** Describes and analyzes simultaneous observations with two DOODSON current meters mainly 14 m depth, 2 m from the bottom, in the Mersey estuary, in a vertical or horizontal line. Peri of turbulent fluctuations varied from a few seconds to several minutes, with a continuous spectr and no predominant periods. The vertical and lateral scales of turbulence are of the same or of magnitude and one-third the scale in the direction of the mean current. *Subject Heading* **1. Tidal currents 2. Turbulent flow in estuaries 3. Mersey Estuary, Eng.**—*C.E.P.B.*

CLIMATIC CHANGES

See also: **Changes of sea level, Iceland** (Jónsson), 12M–461; **Aral Sea level in the past 100 yrs** (L'vov), 12M–470; **Response of Atlantic to climatic variations** (Worthington), 12M–514; **Climatic changes, Pacific** (Robinson), 12M–538; **Forams as indicators of climatic changes** (Shchedrina), 12M–661; **Hist. of the oceans** (Lowenstam), 12M–715.

12M–616 551.461.8:551.555.1:551.462(261,26
† Arrhenius, Gustaf O. S. (*Scripps Inst. Oceanog., La Jolla*), **Climatic records on the oce floor.** (In: Bolin, Bert (*ed.*), **The atmosphere and the sea in motion.** N. Y., Rockefeller

tute Press, **1959.** p. 121–129. 4 figs., 29 refs.) **DLC**—A close relation is found between the nd driven circulation in the Equatorial Current System in the Pacific, and the distribution on e ocean floor of minerals produced by organisms in the surface layer of the ocean. The large riations in time of rate of accumulation of such solids is discussed in terms of corresponding anges of trade wind intensity in the past. Special attention is given to the validity of time imates, and a comparison is made between the Atlanic and the Pacific records. *Subject Head- gs:* **1. Bottom sediments 2. Climatic changes 3. Pacific Ocean 4. Atlantic Ocean.**—*thor's abstract.*

12M–617 551.461.8:551.583.3:551.324.5

Buechley, Robert W. (*Oakland, Calif.*), **Glacier-caused variations in oceanic salinity as a rameter in the theory of Ice Ages.** *International Oceanographic Congress, 1st, N. Y., 1959, eprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 88–90. In English and ench. **DWB** (551.46082 I61pr)—A critical review of Maurice Ewing and William L. nn's **Theory of Ice Ages.** For Pt. 1, *see* 7.11–279, Nov. 1956; for Pt. 2, *see* 10.2–44, Feb. 59, *Met. Abs.* For comment by Livingstone, *see* 12.2–404, Feb. 1961, *Met. Abs.*) The original eory is summarized and in it three weaknesses are noted. A revision is proposed which elimites two of these weaknesses. The two propositions stemming from the revised theory are oposed for crucial testing 1) freeze over cannot occur under conditions of oceanic salinity ver 24.7%) until cross-sections of the North Atlantic are reduced to a most unrealistic extent; freeze over can occur under mixed fresh (under 24.7%) and saline conditions without any luction in cross-section. If these are disproved the revision must be rejected. *Subject Head- gs:* **1. Ice age theories 2. Oceanic salinity variations.**—*I.S.*

12M–618 551.461.8:551.583.7:551.526.6

Emiliani, C. (*Univ. Miami*); Mayeda, T. (*Univ. Chic.*) and Selli, R. (*Univ. Bologna*), **leotemperature analysis of the Plio-Pleistocene series of Le Castella, Calabria.** *International eanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAS, **1959.** p. 91–94. fig. Text in English and German. **DWB** (551.46082 I61pr)—Le stella near Crotone is one of the continuous marine Plio-Pleistocene sections in Italy. A atigraphic thickness of 167.80 m encompassing the paleontologically defined Plio-Pleistocene undary, has been logged and sampled at close stratigraphic intervals. An analysis of the data ows a broad temperature decrease amounting to about 8°C from the late Pliocene into the Early eistocene with various temperature oscillations superimposed upon it. These oscillations indicate at important mountain glaciations may have occurred in the late Pliocene. *Subject Headings:* **Climatic changes 2. Temperature of sea water 3. Le Castella, Italy.**—*I.S.*

12M–619 551.461.8:551.583.3:551.352(268)

Hunkins, Kenneth (*Lamont Geol. Obs., Columbia Univ.*), **Some features of Arctic deep-sea limentation.** *U. S. Air Force. Cambridge Research Center, G.R.D. Research Notes,* No. 29, c. **1959.** p. 11–15. 2 figs. **DWB**—Ice rafting has been an important source of gravel which found at all depths in the cores but clay-sized particles are more abundant being in part ice ted in part current transported. Some sediment is of organic origin consisting of foraminiferal ts although foram production is now very low in Arctic Ocean. The cores indicate a climatic inge 25,000 years ago representing either the beginning of the Wisconsin or the beginning of last stage of its glaciation. The upper 10 cm of the cores, is dark and organic and presumably resents the last cold period, and post-glacial time. From 10–40 cm the core is sandy and am are rare having been deposited presumably during the Sangamon interglacial or the last sconsin warm period. Radiocarbon dates show rates of deposition less than 1/3 cm/1000 years, ring the last cold and post-glacial period. The faunal assemblage is uniform indicating that peratures have not fluctuated more than about 10°C. *Subject Headings:* **1. Marine sediments Ice rafting 3. Climatic changes 4. Arctic Ocean.**—*E.Z.S.*

12M–620 551.465(265)

Maksimov, I. V., **K opredeleniiu poriadkovoĭ velichiny godovogo stoka vod Tikhogo eana v Severnyĭ Ledovityĭ okean cherez Beringov Proliv.** [Determination of the order of gnitude of the yearly discharge of waters of the Pacific into the Arctic through the Bering ait.] *Problemy Arktiki,* (2):51–58, **1944.** 3 figs., table, 2 refs. **DGS**—Actually, available a on the regime of "permanent" currents of the vertical section of any of the straits of the rthern Sea Way for more or less accurate determination of their discharge, are not, and for a tain time will not be sufficient, and only an approximate evaluation is possible. The present icle reports on attempts to determine the order of magnitude of mean monthly discharge in nmer, and of yearly discharge from the Pacific through the Bering Strait into the Arctic.

Observations on the currents in the Bering Strait have been made from 1925 to 1939, with som interruptions, and not systematically, and the author had to limit the use of data to 20 station out of 70. (The stations are listed in the article.) A computation with usual methods yielde the following values: the mean discharge per second in the section of the strait between the ca Dezhnev and Isle of Ratmanov—678.7 thousand m^3/sec, in the section between the Isle Ratmanov and the Little Diomide Isle—54,6 thousand—in the section between Little Diomi Isle and the cape of Prince of Wales—848.7 thousand. The mean per second for the total stra in summer—1581.7 thousand m^3/sec or 4100 km^3 per month (1/15 of the discharge of the Gu Stream). The yearly discharge of the total Strait—30.354 km^3 (1/25 of the Gulf Stream *Subject Headings:* **1. Ocean water transport across Bering Strait 2. Bering Strait.**—*C.K.*

12M–621 551.583:551.326.7:551.461

Schell, Irving I. (*Tufts Univ., Medford, Mass.*), **The ocean ice as an index of clima change.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of paper* Issued Wash., D. C., AAAS, **1959.** p. 113–115. 2 tables. In English and Russian. **DW** (551.46082 I61pr)—An analysis of the ice conditions off Iceland dating back to about 865, ar off South Greenland, to about 1000 (Koch, 1945), together with an analysis of the glaciation a cereals and grain cultivation in Iceland and the temperatures in Iceland, South Greenland, nort eastern North America, and northern Europe during the past 100 years (1851–1950) suggests th the longer-term climate of these areas is reflected in the state of the ice off Iceland and Sou Greenland. Longer periods with little or no ice were apparently associated with relatively hi temperatures, little glaciation and favorable conditions for cereals and grain cultivation in Icelan while similar periods with severe ice conditions were associated with relatively low temperature increase in glaciation and a cessation of cereals and grain cultivation. It may be concluded th the period 900 to 1200 approximately, which was characterized by almost no ice off Iceland a South Greenland, was milder in each of the areas than any subsequent period (Tables 1, While the increase in temperature during the past 100 years in Copenhagen and at some oth stations may be ascribed in part to upbuilding, the major share of the increase must be due a change in climate as shown by the increase in temperature also at Stykkisholm and other statio where no upbuilding had taken place. *Subject Headings:* **1. Climatic changes 2. Ice conditio 3. Historical climatic changes.**—*Author's abstract.*

12M–622 551.526.6:551.465(263,26

*Timofeev, V. T., **Atlanticheskie vody v Arkticheskom basseǐne.** [Atlantic waters in t Arctic Basin.] *Problemy Arktiki,* Leningrad, No. 2:41–51, **1957.** 6 figs., 5 tables, 7 re Transl. into English by John Miller issued by American Meteorological Society under Contra AF 19(604)-1936, May **1959.** 13 p. complete.—A discussion of the oceanographic work carri out by Northern Sea Route expeditions (1948–1955) in the central part of the Arctic basin. T circulation of the Atlantic water is examined. Charts constructed on the distribution of avera and maximum water temperature of the Atlantic layer are graphically presented and discusse The heat content of the water is calculated from the mean temperatures, thickness of the Atlan layer and the areas of the sectors. The exchange between the Arctic basin and the Greenla sea is described. Evidence was gathered indicating or at least suggesting the presence of Atlan water in the Arctic Basin. *Subject Headings:* **1. Oceanographic expeditions 2. Water mass 3. Arctic Ocean.**—*I.S.*

12M–623 551.583.3:581.33:551.462:551.353 551.46

†Wiseman, John D. H. and Todd, Isabelle, **Signification des variations du taux d'accumu tion de *Globorotalia menardii menardii* d'Orbigny dans une carotte de l'Atlantique équatori** [Significance of the variations of the rate of accumulation of *Globorotalia menardii menardii* Orbigny in a core of the equatorial Atlantic.] (In: France. Centre National de la Recherc Scientifique, **La topographie et la géologie des profondeurs océaniques.** Paris, **1959.** p. 19 208. 3 figs., 3 plates, 2 tables, 36 refs. English summary p. 193.) **DLC** (GC83.F7)—Althou cores from Atlantic abyssal plains are generally unsuitable for determining past temperat changes in the upper layer of the sea, those from the flat tops of isolated knolls frequently sh undisturbed and continuous sedimentation, because these environments are outside the zone turbidity currents. These cores retain records of both primary and secondary temperature oscil tions, which can be correlated with radiocarbon dated climatic changes. The rates of accumulat of *Globorotalia menardii menardii,* expressed in $\mu g\ cm^{-2}\ yr^{-1}$, are given for consecutive sectio from an equatorial Atlantic core. Oscillations in this rate can be correlated with second climatic changes provided that the degree of fragmentation in neighboring sections is essentia constant, and *Globorotalia menardii menardii* does not replace other species characteristic of wa water. Microscopical examination of thin sections of this test reveal two distinct calcite laye

l it is possible that 180 determinations give no precise indication of its depth habitat. *Subject adings:* **1. Climatic changes 2. Ocean sediment cores 3. Atlantic abyssal plain.**—*Authors' stract.*

BIOLOGICAL OCEANOGRAPHY

See also: **Annual Report, 1957/1958** (National Oceanog. Council), 12M–19; **M. Lomonosov in Atlantic** (Lednev), 12M–104; **Productivity in coastal waters** (Miyake et al.), 12M–414; **Salty tide** (Ottmann, Ottmann), 12M–417; **Hydrochem. investigations** (Bogoiavlenskiĭ), 12M–668; **Chem. of the sea** (Picotti), 12M–674; **Marine invertebrates** (Hammen, Osborne), 12M–688; **Nitrite in northeast Tropical Pacific** (Brandhorst), 12M–703; **Chem. oceanog. of North Pacific** (Kitamura), 12M–706; **Solar radiation, submarine daylight, and photosynthesis** (Holmes), 12M–785; **Ridging in the eastern Tropical Pacific** (Cromwell), 12M–900; **Chem. features of water and sediments, Northwest Pacific** (Bruevich), 12M–949.

12M–624 551.5:551.46:57(26)

†Barnes, Harold, **Oceanography and marine biology.** London, George Allen & Unwin, **1959.** 3 p. figs., refs. p. 204–213. Price: 35 sh. **DLC** (GC57.B3) Review in *Marine Observer,* ndon, 39(187):47–49, Jan. 1960. Review by F. A. J. Armstrong in *Marine Biological Associan of the United Kingdom, Journal,* 38(2):427, June 1959. Another review by Armstrong in *ience Progress,* London, 47(188):813–814, Oct. 1959. Review by Herbert Curl, Jr., in *Ecology,* rham, N. C., 40(4): 747–748, Oct. 1951.—This is the first book which gives in popular style, general description of the apparatus used by oceanographers. It describes the methods and truments used in sampling living organisms, the use of "sound waves," echo sounders and their plication to survey work and fish finding, and underwater noise. Conventional methods of asuring temperature of sea water, the collection of water samples, drift and current measurents are explained. The last section deals with photography and television and includes dission of photography from the air and underwater. Drawings and photographs supplement the t. *Subject Headings:* **1. Oceanography books 2. Oceanographic equipment 3. Aerial otography 4. Marine biology.**—*E.Z.S.*

12M–625 57(26):006.2(99)

Antarctic laboratory. *Science,* Wash., D. C., 130(3372):377, Aug. 14, **1959. DLC**—The S. Antarctic Biological Research Laboratory built and equipped with a National Science undation grant of $82,000, is located at the Naval Air Facility on Ross Island, McMurdo und. Its program includes studies of land invertebrates, population characteristics of fishes, ology of inshore marine invertebrates, marine taxonomy, and pathology, entomology, and crobiology. *Subject Headings:* **1. Marine biology 2. Ecology of Antarctica 3. McMurdo und, Antarctica.**—*E.Z.S.*

12M–626 551.46:06.045

†Pan American Institute of Geography and History. Committee on Oceanography, **[Report].** *vista Geográfica,* Rio de Janeiro, 21(47):267–276, **1957. DPU, DLC**—In June 1956, the Inim Committee of Oceanography, originally created as a working group in 1955, became a rmanent committee of the Pan American Institute of Geography and History. Its secretary rticipated in various UNESCO sponsored meetings of oceanographic groups in South America ring 1956. Highlights are given of a conference of experts at the marine biology station at ontemar, of the University of Chile, on 15–17 Oct. 1956. Publications of the Committee on eanography are listed. *Subject Headings:* **1. Marine biology 2. Oceanography conferences Oceanography bibliographies 4. Pan American Institute of Geography and History.**—*S. Quiroz.*

12M–627 57(26) 551.46(266)

Pérès, Jean-Marie, *Deux plongées biologiques dans l'Océan Pacifique avec le bathyscaphe, V.R.S. III.* [Two biological submergences in the Pacific Ocean with the bathyscaph F.N.R.S. .] *Académie des Sciences, Paris, Comptes Rendus,* 247(9):757–759, Sept. 1, **1958. DWB, C**—A report on the results of observations gathered during two submergences made by the hyscaph F.N.R.S. III in Japanese waters (western slope of the ocean off Japan, southwest of nhasan Cape). The observations are concerned with temperature, currents and planktonic and nthonic forms. *Subject Headings:* **1. Bathyscaphic observations 2. Marine life 3. Western cific Ocean.**—*A.V.*

12M–628 551.46:577.4:639.

†Hedgpeth, Joel W. (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Introduction (to mari ecology).** *Geological Society of America, Memoir,* No. 67, Vol I:1–16, Dec. **1957.** 2 fig bibliog. p. 13–16. **DLC** (QH542.N3)—The history and pioneers (beginning with Forbes, 184 and the aims of ecological studies, especially marine ecology or paleoecology is related in so detail and ample source literature cited in the bibliography. An attempt is being made today draw in and synthesize the knowledge of biologists, geochemists and other natural scientists inte ested in problems of fisheries and of the sea. The present volume does a lot to advance th synthesis. *Subject Headings:* **1. History of marine ecology 2. Marine ecology.**—*M.R.*

12M–629 551.46:577

†Hedgpeth, Joel W. (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Concepts of marine ecolog** *Geological Society of America, Memoir,* No. 67, Vol. I:29–52, Dec. **1957.** 7 figs., 2 tables, biblio p. 48–52. **DLC** (QH542.N3)—The theories and concepts (such as the ecosystem, trophic rel tionships, the community) used in marine ecology, are defined and discussed in terms of t nutrition, matter of energy relationships or cycles, etc., recognizing that all theories or models a over-simplifications. The carbon cycle is shown in great detail. A long list of references included. *Subject Headings:* **1. Marine ecology 2. Carbon cycle.**—*M.R.*

12M–630 551.526.6:551.463:551.46

†Hedgpeth, Joel W. (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Marine biogeograph** *Geological Society of America, Memoir,* No. 67, Vol. I:359–382, Dec. **1957.** 16 figs., m (colored-fold.), 65 refs. **DLC** (QH542.N3)—Various theories of migration and distribution organisms dependent on water temperature are discussed. The latitudinal, longitudinal, bi-pol and vertical distribution are considered. The text is accompanied by maps representing seve relationships and distributions. No definite conclusions are drawn but there evidently were tim when the colder regions receded or expanded in extent, hence temperature distribution varied co siderably in the past. *Subject Headings:* **1. Marine biogeography 2. Sea water temperatu** —*W.N.*

12M–631 57(26) 551.526.6:57

†Gunter, Gordon (*Gulf Coast Res. Lab., Ocean Springs, Miss.*), **Temperature.** *Geologi Society of America, Memoir,* No. 67, Vol. I:159–184, Dec. **1957.** 3 figs., table, bibliog. p. 17 184. **DLC** (QH542.N3)—A review of knowledge of temperature effects on marine life, rang optima, extremes, aclimatization, effect on reproduction, periodicity of life, distribution, grow form ecological gradients, etc., past and present. *Subject Headings:* **1. Ocean temperature fects on marine life 2. Marine Ecology.**—*M.R.*

12M–632 551.464:57

†Pearse, A. S. (*Duke Univ., Durham, N. C.*) and Gunter, Gordon (*Gulf Coast Res. La Ocean Springs, Miss.*), **Salinity.** *Geological Society of America, Memoir,* No. 67, Vol I:12 157, Dec. **1957.** 7 figs., 5 tables, bibliog. p. 153–157. **DLC** (QH542.N3)—A long and systema review of current knowledge and data on chemical composition of the oceans and effect on mar life: osmosis, ion balance, origin of vertebrates, emigration in response to salinity changes, *Subject Headings:* **1. Salinity effects on marine life 2. Marine ecology.**—*M.R.*

12M–633 551.464:593

Fedosov, M. V. (*Res. Inst., Moscow*), **The chemical basis of primary production in sea.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of pap* Issued Wash., D. C., AAAS, **1959.** p. 886–893. 4 figs., 4 tables. In English and Russi **DWB** (551.46082 I61pr)—The value of primary production is greatly affected by the availabi of chemicals in the sea. Relative content of main biogenic elements in sea water and plankton tabulated. Different ways in which the transport of nutrients proceeds at the sea surface described. Physicochemical conditions controlling the solubility of phosphorus in natural wat are physico-chemical conditions and concentration of biogenic elements, and content of bioge elements in the sea and river discharge. *Subject Headings:* **1. Chemistry of sea water Biogenic elements in sea water 3. Plankton 4. Phosphorus in sea water**—*I.S.*

12M–634 551.5:551.46:591.9:57

Ovey, C. D., **Some effects of weather and climate on surface life in the open ocea** *Weather,* London, 14(11):339–344, Nov. 1959. fig., 9 refs. **DWB**—This is a brief discuss of the effect of energy interchange between ocean and atmosphere upon climate; the penetrat of light into extratropical and tropical water and its effect upon marine life; the effect of

ıperatures upon growth and distribution of marine life; the masses in which nutrients-oxygen,
bon dioxide, nitrogen, organic nutrients become available in the sea and the role of upwelling;
influence of climate as reflected through the effect of wind upon circulation of water in the
, upon the fertility of the seas, illustrated by the distribution of herring and young hake, and
relationship between evaporation and salinity and its reflection on marine life. *Subject Head-*
s: **1. Marine ecology 2. Weather influences on marine life.**—*I.L.D.*

12M–635 551.46:57(26)

†Beliaev, G. M.; Birshteĭn, Ia. A.; Bogorov, G. et al., **O skeme vertikal'noĭ biologichekoĭ**
ıal'nostĭ okeana. [Pattern of vertical biological zonality of the ocean.] *Akademiia Nauk*
SR, Doklady, 129(3):658–661, **1959.** fig., table, 28 refs. **DLC**—Various methods for estab-
ıing the pattern of vertical zonality of oceanic fauna are discussed. The patterns for zonality
pelagic fauna, zonality of abyssal fauna, and for shallow and deep water fauna and the char-
eristics of abyssal and bathic zones are considered. A table and a diagram showing the vertical
ality of ocean fauna are presented. The characteristics of the vertical zonality of plankton
l benthos are examined and their great similarity is pointed out. *Subject Heading:* **1. Vertical**
logical zonality in the sea. I. Vinogradov, N. G. II. Vinogradov, M. E. III. Zenkevich,
A.—*I.L.D.*

12M–636 551.464.38:541.22:57(26)

Redfield, Alfred C., **Biological considerations: the fourth phase.** *National Research Coun-*
Wash., D. C., Publication No. 600, **1959.** p. 101–112. table, 12 refs. **DWB** (551.4601
48co)—"The precision of measuring the biochemical properties of the water would add vastly
re to our understanding of the sea than a like advance in any other direction." The author
ggests the introduction of the population of organisms as the fourth phase of study by referring
the uncertainty existing within this area and the determination of which is important. Several
ımples are given of the manner in which biological studies might contribute to solution of
blems of physical and chemical oceanography. *Subject Headings:* **1. Biochemistry of sea**
ter 2. Physical oceanography 3. Oceanographic chemistry.—*W.N.*

12M–637 551.464.32(262)

Faganelli, A., **Nota preliminare sulla concentrazione dei sali nutritivi rilevata nel mare**
riatico durante la crociera del 1955. [Preliminary note on the concentration of nutrient salts
ained in the Adriatic Sea during the oceanographic expedition of 1955.] *Trieste. Istituto*
erimentale Talassografico, Pubblicazioni, No. 356, **1959.** 11 p. map, 16 refs. Italian and Eng-
ı summaries p. 11. **DWB, DLC**—Conclusions of the observations made on nutrient salts in
Adriatic Sea (thalassographic expedition, August-September 1955) are presented. The scarcity
phosphorus is confirmed; a higher concentration of this element has been observed in the waters
the south basin, probably due to introduction from the Ionian Sea. The concentration diminishes
the central basin; in the north basin said decrease appears restrained by the fluvial introductions.
e nitrous and ammonia nitrogen show agreement; the concentrations of these elements seem
be higher in the north basin and along the occidental coastal zone. The amount of nitrates
embles that of the phosphorus, with higher concentrations in the south basin; remarkable values
found also elsewhere, in the proximity of rivers. As for the silicates, high values have been
erved, agreeing with preceding observations that indicate a maximum in the months of July
l August. The sea water adjacent to the oriental coast has physical and chemical characteris-
s different from those adjacent to the occidental coast. *Subject Headings:* **1. Nutrients in sea**
ter 2. Adriatic Sea 3. Ionian Sea.—*Author's abstract.*

12M–638 551.464.32:551.468.2(265.4)

*Nakamura, Akikazu, et al., **Study on the productivity of Tanabe Bay, Pt. 2.** *Records of*
eanographic Works in Japan, Tokyo, n.s., Special No. 3, issued **1959.** p. 1–68. 49 figs., 5
les, 17 refs. This is a series of 6 articles, some of them continuations of the same articles in
vious issues of this *Journal*—In No. 1, Nakamura, Akikazu, **Tidal currents in Tanabe Bay**
ıd report), p. 1–22, the author deals with the currents of the surface and subsurface layers
the Bay in the two different tidal phases at Mori. Results of observations made at 41 stations
shown in figures. In No. 2, Yamazi, Isamu, **On some plankton indicating the water ex-**
ange in Tanabe Bay in Aug. 1957, p. 23–30, The distribution of plankton was found to be
sely correlated with the hydrographical conditions. No. 3, Fuse, Shin-ichiro, **Oceanographic**
ıditions of Tanabe Bay, Pt. 2, Stratification and fluctuation of hydrological conditions on
sectional survey lines, p. 31–45. This report contains the data on the vertical distribution
various hydrological conditions based on the result of the second survey in the summer of 1957.
tional observations were made on two survey lines, one traversing the mouth of Tanabe Bay

from Bansyo-no-hana to Mori-saki, the other being in the inner part of the bay between Hata zima and Ka-sima. The distribution of water temperature, chlorinity, phosphates and silica are described and compared with the distribution in Nov. 1956. No. 4, Yamazi, Isamu, **On voluminal change of plankton communities caused by tidal current,** p. 47–56. Two sur lines across the bay were made, one near the entrance of the bay and the other in the inner p and ten stations along this line were made at nearly equal intervals, during Aug. 19–29. D include degree of swelling, rainfall, atmospheric pressure and the maximal value of the tidal ra of the sea level. Hourly changes of plankton population and settling volume at each station high tide and low tide on Aug. 23, 26 and 29 were recorded. No. 5, Harada, Eiji, **Occurre of the first stage phyllosoma larva of Panulirus japonicus (von Siebold) in Tanabe B** p. 57–60. This study aimed to produce a profile of the marine productivity and product system and dealt with the horizontal and vertical distribution of the first stage phyllosomes Panulirus japonicus per 1000 cubic metres of water at depth of zero to 30 m during July–Aug The result is shown. No. 6, Hayami, Shoitiro and Fukuo, Yoshiaki, **On the exchange of wa and the productivity of a bay with special reference to Tanabe Bay,** Pt. 2, p. 61–68. *Sub Headings:* 1. **Oceanographic conditions 2. Nutrients in sea water 3. Tanabe Bay, Jap** —*E.Z.S.*

12M–639 551.463.26:66.084:551.464

†Rittenberg, S. C.; Emery, K. O. and Orr, Wilson L., **Regeneration of nutrients in se ments of marine basins.** *Deep-Sea Research,* London, 3(1):23–45, Oct. **1955.** 6 figs., 3 tab 31 refs. **DLC**—A method is described for computing the vertical distribution of volume-scat ing coefficient from a scattering experiment in which an explosion is used as the sound sou and a hydrophone having specified directional properties feeds a recorder through a band- filter. Formulas for the echoes from several model distributions of scatterers are derived functions of time and frequency. The information about marine scatterers obtainable from scattering spectrum is discussed. *Subject Headings:* 1. **Nutrients in sea water 2. Mar scatterers 3. Sound scatterers in sea water.**—*Authors' abstract.*

12M–640 551.464.32:

†Ryther, John H. (*Woods Hole Oceanog. Inst.*), **Potential productivity of the sea.** *Scie* Wash., D. C., 130(3376):602–608, Sept. 11, **1959.** 3 figs., table, 32 refs. **DLC**—Three probl are discussed in the study: (1) the maximum potential rate of production of organic matter in sea under ideal conditions for photogenesis and growth, (2) the approach to or realization of potential, (3) comparison of the sea with the land in this respect. The author points out tha theoretical approach cannot provide exact values, but it does furnish a supplement to the pirically derived data. The calculations are based upon experimentally derived relationships tween unicellular animals and the environment. Comparisons are drawn between the theoret yields and observed values of production by larger aquatic and terrestrial plants. Values recei from observation of the Sargasso Sea, less fertile part of the ocean, indicate that the seas more than twice as productive as the lands. *Subject Headings:* 1. **Productivity of ocean wa 2. Nutrients in sea water.**—*E.K.*

12M–641 551.464.1(261.3):5

†Segerstrale, Sven G. (*Zoological Museum of the Univ. & Biol. Lab. of the Inst. of Ma Res., Helsinki*), **Baltic Sea.** *Geological Society of America, Memoir,* No. 67, Vol. I:751– Dec. **1957.** 21 figs., 2 tables, 4 plates, bibliog. p. 795–800. **DLC** (QH542.N3)—It is as a set and as influencing factors upon fauna and flora that the description of the Baltic Sea and its c acteristics are discussed. A cross-sectional view of this great experiment field is given w 250 rivers dilute the salinity to <8% and its brackish water contains a peculiar mixture of ma and lacustrine organism. Some of the topics treated are: circulation of water, salinity classi tion, temperature, gases and chemical factors, coastal geomorphology, etc. *Subject Headin* **1. Marine ecology 2. Sea water salinity 3. Sea water temperature 4. Chemistry of water 5. Coastal geomorphology 6. Baltic Sea.**—*W.N.*

12M–642 551.4

Fox, Denis L. (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Particulate organic detri** *Geological Society of America, Memoir,* No. 67, Vol. I:383–389, Dec. **1957.** 17 refs., eqs. D (QH542.N3)—The nature, measurement, distribution and utilization of organic matter in suspen and absorbed conditions are discussed. It is estimated that 31×10^{14} lbs or 1.5×10^{12} tons organic detritus maintain the life of marine scavengers. 1.3×10^{11} tons of organic matter per are produced in the sea. The world's terrestrial plant yield is estimated to yield 3×10^{10} per year. *Subject Heading:* 1. **Organic matter in sea water.**—*W.N.*

12M–643 551.464:576.8

†Jannasch, Holger W. and Jones, Galen E. (*both, Scripps Inst. of Oceanog.*), **Bacterial popu- tions in sea water as determined by different methods of enumeration.** *Limnology and ceanography,* Baltimore, 4(2):128–129, May **1959.** 13 figs., 4 tables, 41 refs. **DLC.** Reprinted *California. Univ. Scripps Institution of Oceanography. Contributions, 1959,* issued **1960.** 146–157. **DWB** (551.46 C153co)—Five different cultural and two direct microscopic methods ere employed for estimating the abundance of bacteria in samples of sea water collected from oth oceanic and neritic areas. The cultural methods included macrocolony counts on nutrient agar, lica gel, and membrane filters, microcolony counts on membrane filters, and the extinction dilution ethod. Direct microscopic counts were made of microbes on membrane filters and of microbes ansferred from membrane filters to glass slides. Direct counts showed the presence of from to 9700 times as many bacteria as cultural methods. The extinction dilution method and the icrocolony membrane filter method gave counts 20 and 35 times higher, respectively, than did ny of the macrocolony methods. Direct microscopic counts on membrane filters were approxi- ately 150 times higher than plate counts, and the numbers of microbes transferred from mem- ane filters to glass slides were approximately 2000 times higher than plate counts. In all of the ltural methods, a peptone-yeast extract medium was used. Differences in the abundance of icroorganisms obtained by the various methods are attributed to a variety of factors: the pres- ice of bacteria in aggregates, selective effects of the media, and the presence of inactive cells. marked decrease in bacterial numbers was observed just below the thermocline as reflected in the acrocolony methods but not by the direct microscopic methods. A considerable population of irilli-like forms was noticed directly under the microscope but not after cultivation. *Subject eading:* **1. Bacteria in sea water.**—*Authors' abstract.*

12M–644 551.46:57(26)

*Purasjoki, K. J. (*Univ. of Helsinki and Inst. für Meeresforschung, Helsinki*), **Zur biologie er Brackwasserkladozere *Bosmina coregoni maritima* (P. E. Müller).** [Biology of the Brack- h-water Cladoceran *Bosmina coregoni maritima* (P. E. Müller.] *Finland. Merentutkimuslaitos, lkaisu,* No. 182, **1958.** 117 p. 27 figs., 9 tables, bibliog., p. 109–115. English summary p. 7–109. **DLC**—A comprehensive, well illustrated study of the biology and of the geographic nge of *Bosmina c. maritima* (P. E. Müller). Diversity of opinion concerning taxonomy and igin of *Bosmina c. maritima* (P. E. Müller) is based on variations in its size and morphological aracteristics in different parts of its geographical range. However, a detailed analysis shows ly slight differences between populations inhabiting different parts of the Baltic, corresponding e groups being identical in size and form before the sexual period has been reached, or in pulations reproducing bisexually. Some size differences occur because individuals living under timal conditions grow older and larger than those in less favorable environments. Slight orphological differences between populations result from isolation. *Subject Headings:* **1. Bos- ina c. maritima (P. E. Müller) 2. Marine ecology 3. Baltic Sea.**—*E.Z.S.*

12M–645 551.461.8 551.462:551.8(265)

Saidova, Kh. M., **Raspredelenie foraminifev v donnykh otlozheniiakh i paleogeografiia vero-zapadnoĭ chasti Tikhogo okeana.** [Distribution of foraminifera in bottom deposits, and leogeography of the northwestern part of the Pacific.] *Akademiia Nauk SSSR, Doklady,* 129):1401–1404, **1959.** 3 figs., 8 refs. **DLC.** Abstract in *International Oceanographic Congress, t, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 109–112. In English and Russian. **DWB** (551.46082 I61pr)—A comprehensive report on the results investigations carried out by expeditions of the Institute of Oceanology of the U.S.S.R. Academy Sciences in 1953–1955 on the vessel "Vitiaz." Charts showing the quantitative distribution of ttom calcareous (lime) and forams, and the paleogeography of the basin are presented and plained in detail. *Subject Headings:* **1. Foraminifera deposits 2. Paleogeography of north- estern Pacific 3. Northwestern Pacific.**—*A.M.P.*

12M–646 551.46:595.37

†Barnard, J. Laurens, **Epipelagic and under-ice amphipoda of the Central Arctic Basin.** *S. Air Force. Cambridge Research Center, Geophysical Research Papers,* No. 63, Vol. 1, pt. **1959.** p. 115–152, 23 plates, 9 tables, 105 refs. **DWB, DLC**—This study is based on aterials collected systematically from the polar ice-pack. The collections were made so that me relative idea was given of the relationships of the animals to each other and their general undance. The sampling area and techniques are described. Two major species of amphipoda ich live just below the polar ice pack and the polar cod appear to be the major macroscopic imals which live closely tied to the ice. The life history of Gammarus wilkitzkii indicates that ctic amphipoda have a very slow rate of reproduction and growth. Detailed descriptions and

sketches of various amphipoda are included. In summary, it is noted that the upper waters the Central Arctic Basin support a fauna dominated by normally benthic amphipods, pre-adapt to exist in a tenous environment provided with an inverted substratum. Life in the upper laye is sparse and productivity quite low. *Subject Headings:* **1. Amphipoda 2. Central Arctic.** *E.Z.S.*

12M–647 593.14:551.

Aron, William (*Dept. Oceanog., Univ. Wash., Seattle*), **The use of a large capacity portal pump for plankton sampling, with notes on plankton patchiness.** *Journal of Marine Resear* New Haven, Conn., 16(2):158–173, Aug. **1958.** 6 figs., 3 tables, 20 refs. **DWB, DLC**—A ce trifugal pump with rated capacity of 400 gals/min was used for plankton sampling in Puget Sou With the ship under way, 50 simultaneous paired hauls were made with the pump and with 0.5-meter nylon plankton net. The pumped water was passed through a special filtering unit w negligible damage to the plankton. Data show remarkable agreement between catches of fish eg captured by pump and by tow net. Large discrepancies between catches of motile organisms pump and by tow net are discussed; gear selectivity and plankton patchiness are considered possible explanations for variations which occur between the two sampling devices. Use of la capacity pumps is recommended for further investigations of horizontal and vertical distribut of plankton. *Subject Headings:* **1. Plankton sampling 2. Puget Sound, Wash.**—*Autho abstract.*

12M–648 551.465:593.14(2

Beklemishev, K. V. and Lubny-Gertsyk, E. A., **Raspredelenie zooplanktona v seve vostochnoĭ chasti Tikhogo okeana zimoĭ 1958–1959 gg.** [The distribution of the zooplank in the Eastern North Pacific in winter 1958–1959.] *Akademiia Nauk SSSR, Doklady,* 128(1271–1273, **1959.** fig., 6 refs. **DLC**—The results of a study on the distribution of zooplank in the northeast Pacific Ocean carried out in connection with the IGY program are present The survey was made in the period Oct. 5, 1958–March 14, 1959. Plankton collections were m at 182 stations; at 136 of these stations quantitative catches of zooplankton were made. catches were made at horizons 500–200 m; 200–100 m; 100–50 m; 50–25 m and 25–0 m. amount of plankton varied from several milligrams to 2280 mg/m³. At 60% of the stations w quantitative catches the average biomass in the 0–100 m layer did not exceed 100 mg/m³. richest region with a biomass exceeding 500 mg/m³ was located in a wide zone along the Canad coast and in the Gulf of Alaska. The increase in biomass in this region was the result of diat "florescence." Only in the vicinity of Queen Charlotte Island was the increase caused by z plankton. The greatest biomass was at 50°N lat.; it was associated primarily with a surplus the diatom *Rhizosolenia Alata.* A comparison is made with Canadian data obtained during J 23–March 4, 1957, north of 41°N lat. and a good agreement is found between the Russian Canadian data. The distribution of biomass in various parts of the northeast Pacific Ocean the types of organisms constituting the biomass are described. *Subject Headings:* **1. Plank distribution 2. Zooplankton distribution 3. Northeastern Pacific.**—*I.L.D.*

12M–649 593.14:551.526.64:551.464/5(265/2

†Bieri, Robert (*Scripps Inst. of Oceanog.*), **The distribution of the planktonic chaetogna in the Pacific and their relationship to the water masses.** *Limnology and Oceanography,* Ba more, 4(1):1–28, Jan. **1959.** 26 figs., table, 67 refs. **DLC.** Reprinted as *California. U Scripps Institution of Oceanography. Contributions,* 1959, issued **1960.** p. 17–44. **DWB** (55 C153co)—The geographic extents of 27 species of Chaetognatha in the Pacific have been infer from analyses of 2900 plankton samples taken at more than 900 stations. Two species of cha gnatha—*Sagitta elegans* and *S. maxima*—are found in the Pacific only in the Subarctic W Mass. Four species—*Sagitta enflata, S. Hexaptera, S. pacifica,* and *Pterosagitta draco*—occu the Pacific Equatorial and Central Water Masses. Seven species—*Sagitta robusta, S. regula S. ferox, Krohnitta pacifica, Sagitta bedoti, S. neglecta* and *S. pulchra*—occur in the Equato and Western Central Water Masses. The latter three species appear to be disjunct equato species that are absent from the central equatorial Pacific. *Sagitta pseudoserratodentata* occu the North Pacific Central Water Mass. *S. californica,* essentially a warm-water cosmopolite very rare in the Equatorial Water Mass. The Peru and California Currents are inhabited *Sagitta friderici.* A close relative, *S. crassa,* lives in the coastal waters of Japan. *Sag minima, Sagitta species* (serratodentata group), *Sagitta decipiens, S. lyra,* and *Krohnitta subt* species which have their maximum abundance at about 200 m (somewhat deeper than all of preceding), appear to be limited in the north at about 45°N lat. *Sagitta planctonis, S. ma cephala,* and *Eukrohnia fowleri,* living primarily at depths of 500 m and greater, have been ta in the present study as far north as 55°N lat, both in the Bering Sea and Gulf of Alaska.

ry deep living species, *Heterokrohnia mirabilis*, was taken at a single station in the Eastern uatorial Pacific. The sharpest chaetognatha boundary yet found in the Pacific occurs in the istern Pacific at 18° to 20°N lat and is associated with pronounced temperature, oxygen, and obably salinity gradients. Species distributions analogous to those of the Chaetognatha are und in the euphausiids, copepods, and dinoflagellates among other groups of organisms. *Subject eadings:* **1. Oceanic water masses 2. Planktonic chaetognatha 3. Chaetognatha distribu- on 4. Pacific Ocean.**—*Author's abstract.*

12M–650 551.465:551.526.6:582.265

Furuhashi, Kenzo (*Kobe Marine Obs.*), **Notes on chaetognaths collected from the East iina Sea.** *Umi to Sora* (*Sea and Sky*), Tokyo, 34(2):31–34, **1958.** 2 figs., 3 refs. In panese; English summary p. 31. **DLC**—This paper describes two samples collected in the East iina Sea during the serial observations of oceanography on board the "Shumpumaru" by the igasaki Marine Observatory in the winter and the summer of 1956. It refers to seventeen ecies and discusses the characteristics of different species in different regions and currents. conclusion, the distribution of chaetognaths in the East China Sea is related to the Kuroshio irm current and the cold water masses. *Subject Headings:* **1. Chaetognatha 2. East China a.**—*K.C.*

12M–651 551.464:595.141

Ganapati, P. N. and Satyanarayana Rao, T. S. (*both, Dept. of Zoology, Andhra Univ.*), **udies on the Chaetognatha of the Visakhapatnam coast.** *Andhra Univ., Waltair, India, emoirs in Oceanography,* 1:143–150, **1954.** 5 figs., chart, tables, 13 refs. **DLC** (GC1.A55)—ater movements as indicated by the distribution of the Chaetognatha were studied in the course four oceanographic cruises (number 2, 5, 8, 12) Oct. and Dec. 1952, and Feb. and March 1953. llections from 31 stations were analyzed and are discussed for the individual months. The iount of these Chaetognatha seems to be proportionally related to higher salinity. *Subject eadings:* **1. Chaetognatha distribution 2. Visakhapatnam, East Coast of India.**—*W.N.*

12M–652 551.464:551.526.6:576.8

Ganapati, P. N. and Rama Mohan Rao, V. (*both, Dept. of Zoology, Andhra Univ*), **Studies planktonic copepods, Part 1, Seasonal fluctuations in the distribution with reference to linity and temperature.** *Andhra Univ., Waltair, India, Memoirs in Oceanography,* 1:151–162, **54.** 8 figs., chart, tables, 9 refs. **DLC** (GC1.A55)—Seasonal fluctuations in the distribution copepods are shown to be closely related to high salinity and temperature combined. Rapid riation of temperature is detrimental to copepods. *Subject Headings:* **1. Planktonic copepod stribution 2. Water temperature effects on planktonic copepods.**—*W.N.*

12M–653 551.464:593.14

Johnson, Martin W. (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Observations on inshore ankton collected during summer 1957 at Point Barrow, Alaska.** *Journal of Marine Research,* w Haven, Conn., 17:272–281, **1958.** table, 14 refs. **DWB, DLC**—Analyses of 34 net tows, lected July 16 to August 16, 1957 to depths of about 66 m, were concerned mainly with the croplankton. The concentration of plankton varied greatly while the composition remained ite uniform. *Acartia longiremis, Oithona similis* and *Pseudocalanus minutus* were the most undant copepods. Other species of Calanoida recorded include *Acartia clausi,* especially in iwuk Pond; *Calanus finmarchicus; C. hyperboreus; Centropages mcmurrichi; Epilabidocera phitrites; Eurytemora herdmani;* and *Tortanus discaudatus.* The presence of nauplii and ly copepodid stages of *E. amphitrites* and *T. discaudatus* are of interest in demonstrating some production by these more southerly forms on the Arctic coast and in pointing to a tenuous inal connection of the east and west coast populations of *T. discaudatus.* The macroplankton, ecially *Limacina helicina, Clione limicina* and *Thysanoessa raschii,* were most conspicuous folving heavy on-shore winds bringing in ice. The temporary zooplankton consisted mainly of ecypod, gastropod, annelid, barnacle, echinoderm and brachyuran larvae. *Clypeasteroid plutei* re common, although benthic adults have not been reported from the immediate area. Fish vae were rare. Results from culturing of copepods up to August 15 show that single isolated nales of Cyclops from Imikpuk Lake are capable of producing a minimum of three successive ods without additional fertilization over the period. *Subject Headings:* **1. Plankton distribu- n 2. Point Barrow, Alaska.**—*Author's abstract.*

12M–654 551.46:551.526.6:576.8

Kitou, Masataka (*Japan. Met. Agency*), **Distribution of plankton copepods at the Ocean eather Station "X," May 1950 to April 1951.** *Oceanographical Magazine,* Tokyo, 10(2): 3–199, Dec. **1958.** 3 figs., 3 tables, 7 refs. **DWB, DLC**—The present paper describes the nthly variation and distribution of copepods, and adds information on oceanographic conditions based on the samples collected in May 1950 to April 1951. Monthly composition of copep communities in percentage and frequency of appearance, main copepods for the total number net haul and the distribution of water temperature and chlorinity are tabulated. In general monthly mean number of copepods increased in May, Nov. and March. The successive appe ance of *Oithona similis* was always influenced by the Oyashio water, many warm water spec frequently appeared in Sept. to Nov., and *Calanus cristatus* and *plumchrus* are correlated w the Oyashio water and the Kuroshio warm water. *Subject Headings:* **1. Marine ecology Planktonic copepods distribution 3. Marine biography.**—*K.C.*

12M–655 551.464:593.14:547.9

Krey, Johannes (*Inst. für Meereskunde der Univ., Kiel*), **Chemical determinations of plankton, with special reference to equivalent albumin content.** *Journal of Marine Resear* New Haven, Conn., 17:312–314, **1958.** 3 tables, 11 refs. **DWB, DLC**—Organic substance, t nitrogen and the albumin equivalent were determined by analysis in 23 net plankton samples; of these were also analyzed for dry substance following rough microscopic examination. W variations were found in all components. The following average values were calculated fr the analyses:

Group	% DS	% OS on DS	% Σ N on DS	% Alb. Eq. in OS	% Alb. Eq. in Σ N
Diatoms	11.0	53.7	5.6	20.4	58.3
Ceratia	11.6	84.7	5.0	21.8	70.0
Copepods	13.6	91.5	9.2	37.3	63.2
Mixed Plankton	—	78.2	6.8	24.4	58.2

These analyses agree fairly well with those of other workers, except Brandt and Raben's figu for total nitrogen, which are much higher. The albumin equivalent may serve as a good indica of the active substance in live plankton and of the organic substance as well. The range variation of the albumin equivalent is narrower (14.4 to 28.5% of organic substance) than t of the organic substance in dry substance (36.2 to 95.4%) in phytoplankton, and is narrower in mixed plankton (22.7 to 25.9% as against 64.3 to 89.8%). Thus determination of the albu equivalent (analytically feasible down to 10 μg) may have some advantages in routine analy at sea for estimating the standing crop of plankton and its mineralization potential. *Sub Heading:* **1. Plankton chemistry.**—*Author's abstract.*

12M–656 551.464:547.979:59

Kutiurin, V. M., **Opredelenie soderzhaniia khlorofilla v morskoĭ vode i spektral'nyĭ an pigmentov fitoplanktona.** [Determination of chlorophyl content in sea water and the spec analysis of phytoplankton pigments.] *Sovetskaia Antarkticheskaia Ekspeditsiia, 1955–,* [*terialy*], Vol. 5, issued Leningrad **1959.** p. 173–175. 2 figs., 2 tables. **DLC**—The study concerned with the determination of chlorophyl and its relation to the amount of pigment marine phytoplankton. The chlorophyl content in water has important significance for the eva tion of photosynthesis, which indicates the productivity of the sea and quantity of oxygen separa from the atmosphere. The author describes the spectrophotometric determination of the chlorop at maximum absorption (666–668 m) and yellow pigment for the purpose of determining relative amount of chlorphyl. The description of the method and apparatus is illustrated w graphs and tabulated data. *Subject Headings:* **1. Chlorophyll in sea water. 2. Phytoplank pigment analysis.**—*N.P.S.*

12M–657 551.465:59

Marumo, Ryuzo and Kitou, Masataka (*both, Oceanographical Section, Central Met. Obser* **Planktological and oceanographical conditions from the entrance of Tokyo Bay to Kush (February 1952).** *Japan, Central Meteorological Observatory, Tokyo, Oceanographical Rep* 3(3):69–72, July **1954.** 2 figs. In Japanese; English summary p. 69. **DWB**—The invest tions of planktological and oceanographical conditions in the surface water were performed i sea area from the entrance of Tokyo Bay to Kushiro in February 1952. The results are s marized as follows. The ocean polar front which appears to the east of Kinkazan distinguis clearly the Kuroshio water from the Oyashio water. A water mass affected by the Tsug warm current is recognized to the east of Shioyazaki. The numbers of both cells and species plankton diatoms are large in the Kuroshio and small in the Oyashio. The densest region of diatom concentration exists in the polar front area. There are remarkable differences of diatom communities between the south and north sides of the polar front. *Subject Headin* **1. Plankton distribution 2. Ocean currents 3. Kuroshio current 4. Oyashio curr 5. Tsugaru current.**—*Authors' abstract.*

12M–658 551.464:551.526.6:576.8:593.14

Marumo, Ryuzo (*Japan Met. Agency*), **Plankton as the indicator of water masses and** **ean currents.** *Oceanographical Magazine,* Tokyo, 9(1):55–63, Sept. **1957.** 5 figs., 6 refs. **VB, DLC**—It is claimed that plankton can be treated as an element similar to water tempera- e and chlorinity in the analysis of water masses and currents. This is because there is ɛ respondence between the distribution of plankton, water temperature, and chlorinity. Plankton, vever, may prove to be a more effective indicator of oceanographic conditions in cases where distribution does not correspond to these hydrographic elements. In cases where some other nents act more effectively on the plankton distribution than water temperature and chlorinity, s expected to indicate the existence of water masses, or currents which are not completely iden- ed by these two elements. Four examples are discussed to illustrate the thesis. Several graphs wing the distribution of plankton are included. *Subject Headings:* **1. Plankton distribution** **Vater masses 3. Ocean currents.**—*I.S.*

12M–659 551.46:551.526.6:576.8:593.14

Marumo, Ryuzo; Kitou, Masataka and Ohwada, Mamoru (*all, Japan. Met. Agency*), **Vertical** **tribution of plankton at 40°N, 150°E in the Oyashio water.** *Oceanographical Magazine,* kyo, 10(2):179–184, Dec. **1958.** 4 figs. (incl. photos), table, 6 refs. **DWB, DLC**—To in- tigate the vertical distribution of diatoms, copepods, chaetognaths and pelagic larvae, two series collections were made at 40°18′N, 150°2′E in the Oyashio water from the "Ryofu-maru" at 0–1330 on May 19, 1958. The following results were obtained: 1. The diatom productive es were in the layers above the 50-m depth; 2. *Calanus plumchrus* and *Eucalanus bungii bungii* e found only in the upper 70-m layer; 3. The more advanced stages of ophiuroid larva were nd at greater depths. *Subject Headings:* **1. Plankton distribution 2. Oyashio Current** **Vestern Pacific.**—*K. Chung.*

12M–660 593.12:551.352/353

Schott, Wolfgang (*Hannover, Germany*), **Planktonic foraminifera on the deep-sea floor of** **North Atlantic Ocean.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints* *ibstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 115–118. 3 figs. In English and man. **DWB** (551.46082 I61pr)—An exact biostratigraphical interpretation of the alteration he planktonic foraminifera in deep-sea sediments is only possible after a qualitative and quan- tive investigation of the foraminifera fauna on the present deep-sea floor. Its surface is the tigraphical datum level from which systematic subdivisions and correlations of deep-sea cores t be derived. For this reason maps have been elaborated of the distribution of the most im- ant planktonic foraminifera (17 species) on the present deep-sea floor of the North Atlantic an. (Distribution of *Globigerina pachyderma* (Ehrenberg), of *Globigerina bulloides d' Orbigny* of *Globigerinoides sacculifera* (Brady). Through their interpretation three groups of plank- c foraminfera can be recognized (cold water fauna, fauna of temperate water temperatures, m water fauna). Also the conditions of life of these foraminifera can be established more rately. From these maps and new knowledge exact biostratisgraphical investigations and relations of deep-sea cores from every point of the North Atlantic Ocean are now possible. *ject Headings:* **1. Planktonic foraminifera 2. Deep-sea floor deposits 3. North Atlantic** **ean.**—*Author's abstract.*

12M–661 551.461.8:551.583.3:551.462:593.12(268)

Shchedrina, Z. G. (*Zoological Inst., Acad. of Sci., Leningrad*), **Foraminifera as an indicator** **ecological conditions and climatic changes in the Arctic Basin.** *International Oceano-* *phic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **).** p. 119–120. In English and Russian. **DWB** (551.46082 I61pr)—The data obtained from udy of a considerable number of bottom samples collected by numerous Russian expeditions in seas of the Arctic Basin make it possible to distinguish a number of "standard" groups of aminifera, each of which is characteristic for a certain combination of some ecological factors. estigations carried out on foraminifera fauna of the submarine cores collected by the drifting tic stations, the "North Pole," and the high latitude expeditions of the Arctic Institute in 5–1954 are described. *Subject Headings:* **1. Foraminifera in sea water 2. Climatic changes** **rctic Ocean.**—*I.S.*

12M–662 551.464:593.14(728.7–52)

Smayda, Theodore J. (*Univ. R. I., Kingston*), **Some preliminary results from a quantita-** **analysis of the phytoplankton in the Gulf of Panama.** *International Oceanographic Con-* *s, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, 1959. 01–903. In English and Spanish. **DWB** (551.46082 I61pr)—As part of an investigation lucted by the Inter-American Tropical Tuna Commission in the Gulf of Panama, quantitative phytoplankton samples were collected at 0, 10 and 20 m from November, 1954 through May, 1 These samples were analyzed employing Utermöhl's sedimentation technique. This paper br reports some preliminary results. Subject Headings: **1. Phytoplankton collection data 2.** **of Panama.**—*I.S.*

12M-663 551.464:551.526.6:561.261(52

[illegible], Fukuzo (Fisheries Univ. of Japan). **Relation between diatom quantity and condition in the neighboring sea near the south coast of Honshu, Japan.** *Univ. of Fish. and Sept., Tokyo,* 3(4):92-111, 1958. 10 figs. 22 tables, 11 refs. In Japanese. English s mary p. 92-93. **DLC**—The average numerical abundances of diatom species which are dom in Osaka Bay, the Kii Channel and the Sea of S. Honshu were investigated during 1955-195 connection with sea conditions expressed as characteristics of temp. and chlorinity. It was f that the quantitative analysis of the distribution of dominant species of diatoms is importan the identification of water masses. The characteristics of species are shown in tables. *Su Headings:* **1. Diatoms in sea water 2. Sea water temperature 3. Chlorinity in sea w** **4. Water mass indicators 5. Honshu, Japan.**—*S.T.*

12M-664 551.465:595.1+(265

Vinogradov, M. E. O kolichestvennom raspredelenii glubokovodnogo planktona zapad chast Tikhogo okeana i ego sviazi s tsirkuliatsiei glubinnykh vod. [On the quantitative tribution of deep-water plankton of the Pacific, and its bearing on the circulation of th waters.] *Akademiia Nauk SSSR, Doklady,* 127(4):877-880, 1959. 2 figs. 10 refs. **DWB.** —The results of stratified vertical catches of deep water plankton carried out between 50°N and 45°S lat. in the Pacific Ocean at 14 stations to a depth of 4000 m and at six stations i oceanic depressions (Kurile-Kamchatka, Mariana, Bougainville and Kermadec) are presente analyzed. All observations were made during spring and fall. During this time the biomas plankton varied with depth similarly at all the stations. The surface plankton (0-500 m) stituted 65% and the deep water plankton (500—4000 m) 35% of all the plankton in the 0-40 column. This vertical distribution of plankton and the relationship between surface and water plankton was retained in a considerable part of the Pacific. But since the surface w of the tropics are much poorer in plankton the deep waters appeared correspondingly much p than in the polar and subpolar regions. The fluctuations in amount of surface plankton in t and tropical regions were small in comparison to the differences between tropical and mod latitudes and they did not influence the richness of the deep water plankton. With approac the boundaries of the boreal regions the enrichment of deep water plankton increased and increasing distance it diminished. In the tropical regions subject to the action of deep w coming from areas rich in plankton the food for deep water plankton is supplied by or matter provided from surface layers but is also brought by horizontal currents from more pr tive parts of the ocean. In the Northern Pacific there occurs the most intensive meridional port of deep water in the western part of the ocean as indicated from the distribution of bio To the east of Japan proceeding south the water mass below 500 m participates in the tran As indicated by the plankton the counter current of deep waters is slight or absent altog In the southwest part of the ocean the deep water plankton appeared enriched in the 500-10 layer and below 2000 m which corresponds to the depth of the flow of Antarctic waters bu amount of plankton is less than that observed in the layer southwest of Japan. The 1000-2 layer is very poor in plankton; this is associated with the layer of deep waters moving sout and poor in plankton. The distribution of plankton in the Pacific corresponds to the patte water circulation proposed by Wüst. The flow of deep waters from moderate latitudes is firmed also by an analysis of the qualitative composition of the plankton. The intensity of meridional currents in the Indian and Atlantic Oceans is discussed. *Subject Headings:* **1. P ton distribution in sea water 2. Oceanic water masses 3. Pacific Ocean 4. Indian O** **5. Atlantic Ocean.**—*I.L.D.*

12M-665 551.463.5:535.34:58

Yentsch, Charles S. (Woods Hole Oceanog. Inst., Mass.) and Scagel, Robert F. (Uni British Columbia). **Diurnal study of phytoplankton pigments.** An in situ study of East S Wash. *Journal of Marine Research,* New Haven, Conn., 17:342-362, 1958. 4 figs., 2 tabl refs. **DWB, DLC**—The effect of light intensity on the quantities of chlorophyll and caro pigments in a natural marine diatom community has been observed. Marked daily fluctu in the quantities of these pigments, which showed highest concentrations around mid-day a night, resulted from changes in quantities within the cells. Rates of synthesis and decompo throughout the day have been computed. Highest cellular concentrations of chlorophyl carotenoid pigments corresponded to optimal light intensities for photosynthesis. The differ effect of light on chlorophyll a and on carotenoid pigments, where chlorophyll changes are treme, caused the ratios of these pigments to change during the day. The significance of this nge is discussed. *Subject Headings:* **1. Phytoplankton pigment studies 2. Light effects on ytoplankton 3. East Sound, Washington.**—*Authors' abstract.*

CHEMISTRY AND PHYSICS OF THE OCEANS

See also: **Apparatus and methods of oceanog.** (Barnes), 12M–1; **Oceanog. for mariners** (Zagrodzki), 12M–3; **Training in chem. oceanog.** (Rakestraw), 12M–5; **Physical oceanog.** (Lacombe), 12M–17; **Soviet physics of sea** (Shuleĭkin), 12M–47; **Snellius Expedition, 1929–1930,** 12M–123; **Anaerobic Basin in Caribbean** (Richards, Vaccaro), 12M–284; **Coastal regime, Ivory coast** (Varlet), 12M–402; **Salinity currents in estuaries** (O'Brien), 12M–416; **Salty tide** (Ottmann, Ottmann), 12M–417; **Estuaries of North Carolina** (Posner), 12M–418; **Mass and salt continuity in estuaries** (Pritchard), 12M–419; **Oceanog. and marine biol.** (Barnes), 12M–624; **Biol. considerations** (Redfield), 12M–636.

12M–666 551.462(09):551.35:551.461.8

Chave, Keith E. (*Calif. Res. Corp., La Habra, Calif.*), **Evidence on the history of sea ter from the chemistry of deeper subsurface waters of ancient basins.** *International Oceano- phic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **59.** p. 68–69. German summary p. 69. **DWB** (551.46082 I61pr)—An evaluation is made of t depositional changes in the deeper subsurface waters of ancient basins caused by reactions with closing rocks and mixing with foreign waters. Where subsurface waters have been mixed with teoric waters data on original sea water composition cannot be obtained. Subsurface waters, nixed with meteoric water, are more saline than sea water and have lower Mg/Na or Mg/Cl l higher Ca/Na or Ca/Cl ratios than sea water. *Subject Headings:* **1. Chemistry of sea water History of sea water.**—*I.S.*

12M–667 551.72:551.464:551.510.41:546.264:551.461.8

Ronov, A[lexander] B. (*Inst. Chemistry, Moscow*), **On the post-Proterozoic evolution of composition of the atmosphere and hydrosphere.** *International Oceanographic Congress, , N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 73–76. English and Russian. **DWB** (551.46082 I61pr)—Measurements of the volumes of volcanic l carbonate rocks of all series of the Devonian, Carboniferous, Permian and Triassic systems the present continents have been made and the results of the study of the chemical composition the sedimentary rocks (26,000 specimens) on the Russian platform representing the whole tion from the upper Proterozoic to the Quaternary have been examined. For comparison pub- ed analyses of North American rocks of the same age were used. These data indicate that equilibrium system between the atmosphere and the ocean in the past provided a mechanism the removal and fixation of CO_2 rising up from deep within the earth. A decrease of pCO_2 the system between atmosphere and the ocean also took place. The area and volume of the rld ocean increased in the course of geologic history. *Subject Headings:* **1. Atmospheric nposition 2. Hydrosphere composition 3. CO_2 in the ocean 4. Chemistry of sea water.** .S.

CONSTITUENTS

12M–668 551.464(267,268)

Bogoiavlenskiĭ, A. N., **Gidrokhimicheskie issledovaniia.** [Hydrochemical investigations.] *etskaia Antarkticheskaia Ekspeditsiia, 1955–,* [*Materialy*], Vol. 5, issued Leningrad, **1959.** 159–172. 10 figs., foot-ref. **DLC**—The study of the chemical structure of the Antarctic ean and the Indian Ocean along meridional sections from the Antarctic to the Bay of Bengal described in detail and the distribution of elements in these sections is shown. The hydro- mical information is important for consideration of various problems of the dynamics of the an and its biological productivity; therefore special attention is given to the "standard" hydro- mical determinations of: salinity, concentration of hydrogen ions (pH), alkaline reserves and genic elements. In addition, studies were also made on carbon dioxide content in the atmos- re, oxygen in sea water and in the fish swimming bladder, isotopic composition, chlorophyll tent and analysis of the vegetable pigments. The investigations were undertaken for the fol- ing: the determination of carbon dioxide in atmosphere is connected with the earth's thermal ance, absorption of infrared radiation and reduction of the earth's heat losses. Determination ate of exchange of carbon dioxide between sea and atmosphere is made in view of high absorba- y of it by sea water and its effect on pH. At the same time this reaction has an effect on ny chemical processes in the sea such as: decomposition and separation of the carbonates and er suspended mineral substances, biochemical processes (photosynthesis), etc. Determination of oxygen dissolved in the sea water and fish bladders is connected with the fractionating process and enriching of the atmospheric oxygen with heavy oxygen isotop (O^{18}). Determination of th photosynthesis and evaluation of phytoplankton in production of organic substances. The meth of determination of the above elements and apparatus used are described. The distribution of ea element in two meridional sections on 20°E long. and 97°E long and on various depth to 5000 m shown graphically (10 charts). *Subject Headings:* **1. Chemistry of sea water 2. Antarct Ocean 3. Indian Ocean.**—*N.P.S.*

12M–669 551.463

Bruevich, S. V., **Khimicheskie issledovaniia Instituta okeanologii AN SSSR na da nevostochnykh moriakh i prilegaiushcheĭ chasti Tikhogo okeana.** [Chemical investigatio by the Oceanographic Institute of the Academy of Sciences of the U.S.S.R. in the Far Easte seas and adjoining area of the Pacific Ocean.] *Akademiia Nauk SSSR. Okeanograficheska Komissiia, Trudy,* 3:29–31, **1958.** **DLC** (GC1.A47A2)—A brief note reporting on the leadi trends of investigation of the Oceanographic Institute. Studies are being conducted: on qua titative chemistry and processes in the sea; on the chemical and geochemical elements; radioacti and stable isotopes in the sea; biological productivity of the sea; physico-chemistry of sedimen and the interrelationship of ocean and the atmosphere. *Subject Headings:* **1. Chemistry of s water 2. Physico-chemistry of sea water 3. Ocean-atmosphere relationships 4. Weste Pacific Ocean.**—*E.Z.S.*

12M–670 551.4

Goldberg, Edward D. (*Scripps Inst. Oceanog., La Jolla*), **The processes regulating the co position of sea water.** *Journal of Chemical Education,* 35(3):118–119, March **1958.** 4 tabl 15 refs. *Reprinted as California. Univ. Scripps Institution of Oceanography, Contributio* 1958, issued **1959.** p. 105–108. Contribution No. 981. **DWB** (551.46 C153co 1958) Abstra in: *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of pape* Issued Wash., D. C., AAAS, **1959.** p. 70–71. **DWB** (551.46082 I61pr)—The paper divides t mechanisms that regulate the chemical composition of sea water into two general classes: th inorganic reactions that would occur in a sterile ocean and the reactions that arise through t existence of living matter. The physical processes which may influence these chemical process are also considered. The relationship between chemical processes and the changes in compositi of the oceans with time is discussed. The paper includes four tables which illustrate, the striki differences in composition between source materials of the chemical species and the sea water, t relative weight ratios of sodium, potassium and magnesium in igneous rocks, rivers and lak and marine waters; comparison of observed concentrations of certain minor elements in sea wa with those concentrations calculated upon the basis of their most insoluble compound, and t typical concentrations of some elements in manganese nodules and pelagic clays from the Paci Ocean. *Subject Headings:* **1. Chemistry of sea water 2. Pacific Ocean.**—*I.S.*

12M–671 551.4

†Ishibashi, Masayoshi and Higashi, Shinnosuke (*both, Faculty of Chemistry, Kyoto Univ* **On the regularities of the amount of elements dissolving in sea water, Pt. 3.** *Society of S Science, Japan, Bulletin,* 12(6):322–328, Dec. **1959.** fig., 4 tables, 24 refs. In Japanese; Engl summary p. 322. **DLC**—The partition coefficients of some sparingly soluble elements (such hydroxides) were calculated from the data of average chemical composition of sediments a the amount of elements in sea-water. The values are: Al = 0.180, Fe = 1, Ti = 1.73, Mn = 0.2 Cr = 0.2, V = 0.035, Ni = 0.011, Co = 0.010, Cu = 0.019, Zn = 0.0024, Pb = 0.0055, = 0.00024, As = 0.000087, Th = 0.15, U = 0.0001. From the viewpoint of consideration of tendencies for accumulation of those elements in sea-water, it is obvious that the element wh has a low partition coefficient has in general a high tendency for accumulation in sea-water. addition, several other estimates and the theoretical basis for the calculation were reported a discussed. *Subject Heading:* **1. Chemistry of sea water.**—*Author's abstract.*

12M–672 551.4

Ishibashi, Masayoshi (*Faculty of Science, Kyoto Univ., Kyoto*), **Quantitative distributi of chemical elements in the sea water.** (In: UNESCO Symposium on Physical Oceanograp Tokyo, Oct. 1955, **Proceedings,** pub. **1957.** p. 175–178. 2 figs., 3 tables. French summary 175.) **DWB**—Regularity in the relation between the quantity of the elements dissolved in water and their atomic numbers was found. A regularity between the ratio of the amount of element in sea water to that of the same element in the Earth's crust and ionic potential was a found. *Subject Headings:* **1. Chemistry of sea water 2. Oceanographic chemistry.**—*E.Z*

12M–673 551.463/4

Leipper, Dale F., **Classical hydrographic procedure and its relation to the physical and emical properties of sea water.** *National Research Council, Wash., D. C., Publication* No. 0, **1959.** p. 1–9. 5 refs. **DWB** (551.4601 C748co)—Some specific problems facing an oceagrapher attempting to compute the pattern of surface layer currents such as the Gulf Stream the western Atlantic Ocean and the Kuroshio in the western Pacific considering not only the rrow and rapid currents but also the diverse and weaker branches are discussed in the introction. Then the method of applying basic principles (pressure force and Coriolis force) to stematic observations is considered. Finally, the classical procedure is described with stress on ssible sources of errors in the method of computing dynamic height as distinguished from ometric height. *Subject Headings:* 1. **Hydrographic procedures 2. Chemical properties of a water 3. Physical properties of sea water.**—*W.N.*

12M–674 551.464

Picotti, M., **Moderni metodi e ricerche di chimica nel mare.** [Modern methods and search on chemistry of the sea.] *Associazione Geofisica Italiana, 7th, Rome, Nov. 1957, Atti,* b. Rome (1958?) p. 45–47. **DWB**—General remarks on the more modern methods of chemical alysis of ocean water and the importance thereof, including studies of C^{14} content, and applicans of results to calculations of sound velocity in the sea, productivity of the oceans, photonthesis, etc. *Subject Headings:* 1. **Oceanographic chemistry 2. Chemistry of sea water.** *M.R.*

12M–675 551.464

†*Shimizu, Kazuo (*Central Research Inst., Japan Monopoly Corp.*), **Studies on the minor nstituents of sea water and brine.** *Society of Salt Science, Japan, Bulletin,* 13(3):120–136, ne **1959.** fig., 18 tables, 37 refs. In Japanese; English summary p. 120–121. **DLC**—Conts of four studies. **Pt. 1, On copper, zinc and lead in sea water and brine. Pt. 2, On uminum and iron in sea water and brine. Pt. 3, On manganese in sea water and brine. . 4, On mean molybdenum in sea water and brine.** Methods of sample collection, the conntration ratios and the results obtained are discussed in detail and shown in extensive tables. *bject Heading:* 1. **Chemistry of sea water.**—*E.Z.S.*

12M–676 551.464

Torii, Tetsuya (*Chiba Univ., Tokyo*), **Chemical studies on the nutrient matter in sea ter between Cape Town and Lützow-Holm Bay, Antarctica.** *International Oceanographic ngress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** 904–905. In English and German. **DWB** (551.46082 I61pr)—Samples of sea water were ken daily between Cape Town and Lützow-Holm Bay, Antarctica, during the return cruise of second Japanese Antarctic Research Expedition ship "Soya," which left Cape Town on Dec. , 1957 and returned on March 5, 1958. The water samples were subjected to chemical analysis d the amount of the following were determined: chlorinity, dissolved oxygen, pH, silicate, osphate, ammonia, nitrite and total carbonate. *Subject Headings:* 1. **Chemistry of sea water Nutrients in sea water 3. Antarctic Ocean.**—*I.S.*

Aluminum

12M–677 551.464:546.621

Sackett, W. M. and Arrhenius, G. O. S. (*both, Scripps Inst., La Jolla, Calif.*), **Aluminum ntent of ocean and other natural waters.** *International Oceanographic Congress, 1st, N. Y., 59, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 824–825. German mmary p. 824–825. **DWB** (551.46082 I61pr)—By fluorescence measurements the distribution aluminum between dissolved and particulate species in natural waters was investigated. The lues of dissolved aluminum in ocean and the continental runoff waters and those of aluminum particulate form are given. The residence time of dissolved aluminum in the oceans is callated to be of the order of 4000 years. *Subject Heading:* 1. **Aluminum in sea water.**—*I.S.*

Boron

12M–678 551.464:546.27:551.462:551.351.3

†Landergren, Sture, **Sur la distribution du bore dans les sédiments marins argileux.** [On distribution of boron in marine clay sediments.] (In: France. Centre National de la cherche Scientifique, **La topographie et la géologie des profondeurs océaniques.** Paris, **59.** p. 29–32. 2 tables, 7 refs. English summary p. 29.) **DLC** (GC83.F7)—The content of ron in marine clay sediments is considerable if compared with the average for the upper lithohere. This enrichment is due to the transfer of boron from the sea water to the clay minerals. cording to V. M. Goldschmidt the transfer is a kind of adsorption phenomenon. The investigans on the geochemistry of boron, begun by Goldschmidt, have been continued in the geochemical

laboratory of the Geological Survey of Sweden. The results so far obtained indicate that tw principal factors regulate the boron content in the marine clay sediments, namely, the salinity o the water where the precipitation of the sediment occurs and the grain size distribution of th sediment. Thus, the variations in the boron content of deep sea clay recently studied depend o these two factors. No age effect—supposed by GOLDSCHMIDT—has been stated in these studie Laboratory experiments of the transfer of boron in the system sea-water—clay are in progress i the geochemical laboratory mentioned. *Subject Headings:* **1. Boron in sea water 2. Boron i marine sediments.**—*Author's abstract.*

12M–679 551.464:546.2

Yamamoto, Hiroshi and Imai, Yoshihiko (*both, Kochi Univ.*), **On the boron in the se water of Urado Bay.** *Umi to Sora (Sea and Sky)*, Tokyo, 35(2/3):41–43, **1959.** 2 figs., tabl 5 refs. In Japanese; English summary p. 41. **DLC**—The quantity of boron in the sea wate of Urado Bay was determined spectrophotometrically by utilizing the red color developed wit carmine in a high concentration of sulfuric acid. The samples were collected from 8 observatio stations of Urado Bay in Oct. 28, 1959. The quantity of boron in sea water ranges from 0.14 to 0.421 mg atoms/L and the ratio of chlorinity to boron from 22.8 to 22.4×10^{-5}. *Subje Headings:* **1. Boron in sea water 2. Boron-chlorine ratios 3. Urado Bay, Japan.**—*Author abstract.*

12M–680 551.464:546.27

Gast, James A. and Thompson, Thomas G. (*both, Univ. Wash., Seattle*), **Borate concentr tion in the surface waters of oceanic areas.** *International Oceanographic Congress, 1st, N. Y 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 863–864. I English and German. **DWB** (551.46082 I61pr)—The effect varying amounts of evaporation an precipitation have on the boron-chlorinity ratio of surface water was examined by analyses o water from 12 stations. One of these stations is located in the Arctic Ocean at 83.5°N, 155.0°W Six stations were in a great circle between Cape Flattery, Washington and Adak in the Aleutia Islands, and five stations were between California and the Hawaiian Islands. The results of th examination are briefly discussed. *Subject Headings:* **1. Chemistry of sea water 2. Boron chlorine ratios 3. Arctic Ocean 4. Pacific Ocean.**—*I.S.*

12M–681 551.464:546.27

Gast, James A. and Thompson, Thomas G. (*both, Univ. of Wash., Seattle*), **Evaporation boric acid from sea water.** *Tellus,* Stockholm, 11(3):344–347, Aug. **1959.** fig., 16 refs. **DL** Abstract in: *International Oceanographical Congress, 1st, N. Y., 1959, Preprints of abstracts papers.* Issued Wash., D. C., AAAS, **1959.** p. 861–862. German summary p. 862. **DW** (551.46082 I61pr)——Previous investigators have shown that the boron-chlorinity ratios rain waters are many times greater than the boron-chlorinity ratio of sea water. The presen of boron in the atmosphere has been attributed to sea spray, volcanic activity, accumulation dust, evaporation from plants, and industrial pollution. Data are presented to demonstrate th boric acid in sea water has a vapor pressure at ordinary temperatures of the sea and, when se water evaporates, boric acid occurs in the condensate of the water vapor. It is postulated tha while some of the boron in the atmosphere can be attributed to the sources mentioned above, mo of the boric acid results from evaporation from the sea. *Subject Headings:* **1. Boron-chlorini ratio sea water 2. Boric acid from sea water.**—*Authors' abstract.*

CALCIUM

12M–682 551.464:546.

Lyman, John, **Chemical considerations.** *National Research Council, Wash., D. C., Public tion* No. 600, **1959.** p. 87–97. 4 tables, 16 refs. **DWB** (551.4601 C748co)—The calcium chlorinity ratio in sea water is discussed. Tabulated data include: (1) runoff received in th Atlantic, Indian, Antarctic and Pacific Oceans. (2) Calculation of increased weight of salt in liter of sea water in the Pacific compared with that at the surface. (3) Summary of KNUDSE and SÖRENSON determinations of chlorinity-salinity-density relationship and (4) effect of a 1 solution on increasing density of water. The difference in composition of the current water the Arctic where all oceans intermingle to some extent depends on difference in runoff receiv by the individual oceans. Ocean currents can be identified by analyzing water samples. Titra may be replaced by an interferometer determining salinity to ± .005 0/00. State Univ. Mosco is the inventor. *Subject Headings:* **1. Sea water chemistry 2. Calcium-chlorine ratios Interferometers.**—*W.N.*

12M–683 551.464:546.

Park, Kilho and Hood, Donald W. (*both, Dept. Met., Texas A. & M.*), **Effect of organ material on the solubility of calcium carbonate in sea water.** *International Oceanograph* *ongress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** 873–875. 2 figs. German summary p. 875. **DWB** (551.46082 I61pr)—Results of several oservations of the interaction of organic concentrates with inorganic calcium as traced with Ca^{45} e reported. Buffer curve of organic concentrate in sea water is given and effect of organic aterial on the dialysis of calcium is also shown in graphic form. *Subject Headings:* **1. Organic atter in sea water 2. Calcium carbonate in sea water.**—*I.S.*

12M–684 551.464:546.41/6

†Pate, John B. and Robinson, Rex J. (*both, Univ. of Wash., Seattle, Wash.*), **The (ethyl- iedinitrilo) tetraacetate titration of calcium and magnesium in ocean waters, Pt. 1, De- rmination of calcium.** *Journal of Marine Research,* New Haven, Conn., 17:390–402, **1958.** tables, 31 refs. **DWB, DLC**—Various factors influencing the determination of calcium in ean water by (ethylenedinitrilo) tetraacetate titration have been investigated. Using Cal-Red indicator, the method has been applied in titrating 36 ocean samples. A calcium-chlorinity tio of 0.02134 was obtained. The speed, preciseness, accuracy and simplicity of the method ould encourage its future use. *Subject Headings:* **1. Calcium in sea water 2. Magnesium in a water.**—*Authors' abstract.*

12M–685 551.464:546.41:546.46

Skopintsev, B. A. and Kabanov, V. V., **Kompleksometricheskii metod opredeleniia kal'- iia i magniia v morskikh vodakh.** [Complexometric method of determining calcium and mag- esium in sea water.] *Akademiia Nauk SSSR. Morskoĭ Gidrofizicheskiĭ Institut, Trudy,* 13: 30–136, **1958.** 5 tables, 17 refs. **DLC, DWB** (M(055) A313tr)—The author describes the sults of determination of total Ca^{++} and Mg^{++} and Ca^{++} alone both in solutions (0.1 N) with nown contents of these cations and in sea (ocean) water by means of the complexometric titra- on method of G. SCHWARTZENBACH. The preparation of the titre solution of sodium ethyl- ediaminet tracetate (triolene) with eriochrome black for Ca^{++} and Mg^{++} totals and with murexide r Ca^{++} is described. In preparing the titre it is best to use chemically pure calcium carbonate a solution of hydrochloric acid with added Mg^{++} ion either in the triolene solution as a mag- esium complex or in the calcium salt solution as magnesium salt. In the case of the latter a ouble titration is carried out; first with an identical and then with a double amount of magnesium lt. It is desirable to carry out control determinations of the triolene titre by using a zinc aloride solution prepared from pure granular metallic zinc. Solutions of calcium chloride and nc chloride are prepared in 0.02(0.01) normal concentration. The results of experiments showed at by means of this method it is possible to determine the totals of Ca^{++} and Mg^{++} and Ca^{++} parately even if the ratio of Mg^{++}/Ca^{++} is 9:1 which is considerably higher in comparison with a water. The determinations of Ca^{++} and Mg^{++} in ocean water show values of Ca^{++} + Mg^{++} id Ca^{++} close to the average values of ocean water. *Subject Headings:* **1. Calcium in sea ater 2. Magnesium in sea water**—*I.L.D.*

CARBON DIOXIDE

12M–686 551.464:546.264 551.464:551.510.41:546.264

*†Revelle, Roger (*Scripps Inst. of Oceanog., LaJolla, Calif.*) and Fairbridge, Rhodes (*Dept. Geology, Columbia Univ., N. Y.*), **Carbonates and carbon dioxide.** *Geological Society of merica, Memoir,* No. 67, Vol. 1:239–295, Dec. **1957.** 8 figs., 8 tables, bibliog. p. 285–295, eqs. **LC** (QH542.N3)—A thorough and graphic review of all aspects of CO$_2$ content and equilibrium sea and between sea and atmosphere, hydrosphere and rocks, living organisms, etc. Origin of O$_2$, changes with time and their effects, solubility, effect of coastal structure, of temperature and linity, pressure, pH values, precipitation of inorganic and organic compounds containing CO$_2$ bacteria, algae, marine invertebrates, vertebrates), disintegration solution, erosion in intertidal ne, recent deep sea sedimentation, etc. A list of 300 references is appended. *Subject Headings:* **CO$_2$ in sea water 2. CO$_2$ balance-earth-sea-atmosphere 3. Marine ecology.**—*M.R.*

12M–687 551.511:551.464:546.264

Broecker, Wallace S. and Walton, Alan (*both, Lamont Geol. Obs., Palisades, N. Y.*), **Com- arison of CO$_2$ exchange rates between the atmosphere and fresh water systems with that etween the atmosphere and the ocean.** *International Oceanographic Congress, 1st, N. Y., 1959, reprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 856–858. 3 tables. **WB** (551.46082 I61pr)—An attempt was made to obtain similar rates as obtained from model lculations based on the C^{14} concentration in the atmosphere and surface ocean for selected closed sin lakes in the western United States in order to understand better the processes involved in e transfer. The results and the computed exchange rates are summarized in tabular form. iterestingly enough they are of the same magnitude as those obtained for the ocean. *Subject eadings:* **1. Carbon dioxide exchange ocean-atmosphere 2. C^{14} in atmosphere 3. C^{14} in esh water.**—*I.S.*

12M–688 551.464:592:546.26

†Hammen, Carl S. and Osborne, Paul J. (*both, Duke Univ. Beaufort, N. C.*), **Carbon dioxid fixation in marine invertebrates: a survey of major phyla.** *Science*, Wash., D. C., 130(3386) 1409–1410, Nov. 20, **1959.** 2 tables, 20 refs. **DLC**—Fourteen species of marine invertebrate representing 12 phyla were kept in sea water containing $NaHC^{14}O_3$ for 1 hour. All of them fixe CO_2 into acids of the Krebs citric acid cycle. In most species the major portion of the radic activity recovered after chromatography was in succinic, fumaric, and malic acids. The finding favor the hypothesis that both CO_2 fixation and the citric acid cycle are virtually universal amon marine invertebrates. *Subject Headings:* **1. Carbon dioxide cycle 2. Marine invertebrate 3. Chemistry of sea water.**—*Authors' abstract.*

12M–689 551.510.41:546.264:551.46

Hanya, Takahisa and Ito, Yuji (*both, Tokyo Metr. Univ.*), **Preliminary studies of the inter changing velocity of carbon dioxide between the sea water and the air.** *International Oceano graphic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS **1959.** p. 864–866. fig., table. French summary p. 865–866. **DWB** (551.46082 I61pr)—Th possible relationship between the interchanging velocity and the partial pressures of carbon dioxid in air and in sea-water was studied. Sea water samples were taken in the North Pacific Ocea and in Sagami Bay near Enoshima. The ways in which the exchange process was examined ar described and graphically illustrated. Some of the experimental results are presented in tabula form. *Subject Headings:* **1. Carbon dioxide exchange ocean-atmosphere 2. North Pacifi Ocean 3. Sagami Bay, Japan.**—*I.S.*

12M–690 551.46

Kanwisher, John (*Woods Hole Oceanog. Inst., Woods Hole, Mass.*), **Partial pressure of CO in sea water.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts o papers.* Issued Wash., D. C., AAAS, **1959.** p. 866–867. In English and German. **DW** (551.46082 I61pr)—A method developed for the direct measurement of PCO_2 in sea water showe sea water to behave as follows: a 1% change in the total combined CO_2 in the carbonate syster alters the partial pressure about 25%. A temperature rise of 10 c increases PCO_2, 4.5%. It i shown how these measured properties of sea water can be used in determining some aspects of th movement of CO_2 in nature. *Subject Heading:* **1. Carbon dioxide in sea water.**—*I. S.*

12M–691 551.510.41:551.464:546.26

Koroleff, Folke (*Inst. Marine Res., Helsinki*), **Carbon dioxide in the air and the surfac waters in the Barents Sea area.** *International Oceanographic Congress, 1st, N. Y., 1959, Pre prints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 868–870. table. In Eng lish and German. **DWB** (551.46082 I61pr)—The calculated values from the hydrographic dat of the total carbonic acid content and the carbon dioxide tension and the values directly determine of the carbon dioxide partial pressure of the surface water at 45 stations are presented. Th direct measurements and the hydrographic data were obtained as a part of the oceanographic wor for the International Geophysical Year by a Finnish expedition on board the M/S Aranda fro July 1st to 27th, 1957. *Subject Headings:* **1. Carbon dioxide in the atmosphere 2. Carbo dioxide in sea water 3. Barents Sea.**—*I.S.*

12M–692 551.464:551.510.41:546.26

Leahy, Richard G. (*Woods Hole Oceanog. Inst., Woods Hole, Mass.*), **Atmospheric CO measurements along the eastern coast of North America.** *International Oceanographic Con gress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959** p. 870–871. French summary p. 871. **DWB** (551.46082 I61pr)—A brief paper reporting tw types of atmospheric carbon dioxide measurements made with a commercial infrared spectrometer The measurements were recorded during all seasons at the Woods Hole Oceanographic Institutio in Woods Hole and during November and December at Gay Head on the island of Martha's Vine yard off the New England coast. The variability of CO_2 level and other characteristics of carbo dioxide are described. *Subject Headings:* **1. Atmospheric carbon dioxide measurement tech niques 2. Infrared spectrometers 3. East coast of North America.**—*I.S.*

12M–693 551.464:551.508.91:546.26

Verduin, Jacob (*Bowling Green, Ohio State Univ.*), **Use of an aerated reference sampl when measuring dissolved carbon dioxide.** *Ecology*, Durham, N. C., 40(2):322–323, Apri 1959. 6 refs. **DWB, DLC**—A new accurate and simple method is presented for determinin free carbon dioxide concentration which involves collecting duplicate water samples and aeratin them. Statistical tables and the chemical equations are presented. *Subject Heading:* **1. Carbo dioxide measurement techniques.**—*O.T.*

COPPER

12M–694 551.464:546.56(262)

Meng, Nidia (Chierego) and Picotti, Mario, **Crociera talassografica adriatica 1955, IV, La istribuzione del rame nelle acque dell'Adriatico.** [Adriatic thalassographic cruise 1955, Pt. , Copper distribution in Adriatic Sea waters.] *Trieste. Istituto Sperimentale Talassografico, 'ubbl.,* No. 1362:421–424, **1960.** fig., table, 5 refs. Italian and English summaries p. 424. **WB, DLC**—The results of the analysis of copper in 30 samples collected in the summer of 955, at various depths, along the median line of the Adriatic Sea are made known. The results dicate a uniform distribution of the copper concentration, but for the Adriatic; in this zone, at bout 200 m of depth, we have an exceptionally low concentration that varies from 0.00 to 0.04 g-at/1. *Subject Headings:* **1. Copper in sea water 2. Adriatic Sea.**—*Authors' abstract.*

12M–695 551.464:546.56

Tikhonov, M. K. and Zhavoronkina, V. K., **K voprosu opredeleniia medi v morskoĭ vode.** The problem of determining copper in sea water.] *Akademiia Nauk SSSR. Morskoĭ Gidrofizi-heskiĭ Institut, Trudy,* 13:137–142, **1958.** 3 tables, 7 refs. **DLC, DWB** [(M(055) (A313tr)]. ransl. into English in the corresponding number of its *Bulletin of the Academy of Sciences, JSSR, Geophysics Series.*—Since a large number of chemical elements are present in sea water n very small concentrations they cannot be determind by microchemical, spectral and polarographic nethods without preliminary extraction of sea water. An examination of the average chemical lements composing sea water shows that copper amounts to the order of 2.8×10^{-6} of weight ercent which corresponds to $10\gamma/l$. The necessary enrichment is attained by extraction of the opper. The procedures for extracting the copper and for the polarographic examination of the xtracted copper solution are described and polarographic data of sea water after extraction are resented. The amount of copper in an extracted solution of Black Sea water from the surface ayer in the coastal zone was found to be 1.4×10^{-4} percent—corresponding to 1400 γ. The olarographic method does allow determination of concentration of the order of $n. \times 10^{-7}$ or $. \times 10^{-8}$ (percent). The colorimetric method for determining the concentration of copper in ea water is more precise; since without preliminary extraction of the solution it is possible to etermine concentrations up to $1 \times 10^{-7}\%$. The procedure of this method is outlined and results btained are presented. *Subject Headings:* **1. Copper in sea water 2. Black Sea.**—*I.L.D.*

12M–696 551.464:546.56(262)

Meng, Nidia (Chierego) and Picotti, M. (*both, Trieste*), **The distribution of copper in the driatic.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of apers.* Issued Wash., D. C., AAAS, **1959.** p. 817–819. fig., table. **DWB** (551.46082 I61pr) –Thirty samples of sea water were collected at various depths, on stations along the axis of the driatic during the summer of 1955. The analyses of these samples, presented in tabular form, how a rather uniform distribution of copper. However, a small variation can be noticed if the verage concentration of copper is calculated for different depths. *Subject Headings:* **1. Copper n sea water 2. Adriatic Sea.**—*I.S.*

IODINE

12M–697 551.464:546.15(266,268)

Barkley, R. A. and Thompson, Thomas G. (*both, Univ. Wash., Seattle*), **Iodate-iodine and otal iodine content of sea water.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 813–814. 2 tables. erman summary p. 814. **DWB** (551.46082 I61pr)—Sea water samples were collected from six astern North Pacific Oceanographic stations, one Arctic station, one station in the inland waters f the state of Washington. For these samples, the iodate and total iodine content were de-ermined. The results, summarized in tabular form, show the total iodine content to vary only lightly with depth and from station to station. Iodate-iodine values were found to vary greatly nd in an irregular manner except at the Arctic station. *Subject Headings:* **1. Iodine in sea vater 2. Eastern North Pacific Ocean 3. Arctic Ocean 4. Coast of Washington.**—*I.S.*

12M–698 551.464:546.15(265)

*Sugawara, Ken and Terada, Kikuo (*both, Chemical Inst., Nagoya Univ.*), **Iodine distribu-ion in the Western Pacific Ocean.** *Nagoya, Japan. Univ. Institute of Earth Sciences, ournal,* 5(2):81–102, Sept. **1957.** fig., numerous tables, 12 refs., eq. **DWB**—By using the ethod of determining minute quantities of iodide established by the present writers, the distribu-ion of various forms of iodine in the Western Pacific Ocean was determined. 326 samples were ollected from different levels at 50 stations distributed in an area extending from the northern nd of the Bering Sea to the equator and from the northeastern part of the Japanese Main Island o a point close to Hawaii. The data of analysis revealed: a) that the iodine in sea water is ractically all in two different forms, iodide and iodate; b) that total iodine averages 0.30 μg-at/1 and the percentage of iodide to total iodine varies from 0 to 100% ; c) that for the surfa water, total iodine tends to decrease from the north towards the equator, the off-shore waters the Japanese Main Island being remarkably high in their total iodine value ; d) that for iodi iodate and total iodine, there is no regular vertical variation, the exception being that the amou of total iodine is generally small at the surface layers in comparison with the value in subsurfa layers. As factors possibly contributing to the variation of iodine in sea water, the followi were mentioned and discussed ; a) removal of iodine through assimilation by planktonic organis and addition of the element liberated from decay of organic materials into the water ; b) select capturing of iodine by flocculent hydroxides of metals sinking to the bottom ; c) Addition iodine by outflow of land waters in which the ratio I/C1 is greater than in sea water ; d) select escape of iodine from the sea surface. Kinds of factors which possibly cause the variation iodide-iodate ratio were mentioned and discussed. *Subject Headings:* **1. Iodine in sea wa** **2. Marine ecology 3. Western Pacific Ocean.**—*Author's abstract.*

IRON AND MANGANESE

12M–699 551.464(262

Dobrzhanskaia, M. A. (*Biol. Stat., Sevastopol*), **Constant of dissolved and suspended fra tion in iron in the Black Sea.** *International Oceanographic Congress, 1st, N. Y., 1959, P prints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 884–885. In English a Russian. **DWB** (551.46082 I61pr)—In the Black Sea dissolved iron is absent in most of vertical column except in the layer between 1000–1500 to 2000 m. The major portion of ir is in the suspended fraction. The areal and vertical distribution of iron in the Black Sea described. The photosynthetic zone in the Black Sea has nearly the same iron content as ot seas. Distinct seasonal trends in the deposition of iron are not found. *Subject Headings:* **Iron in sea water 2. Black Sea.**—*I.S.*

12M–700 551.462:551.351.3:546.02:546.8

Chow, Tsaihwa J. (*Calif. Inst. of Technology, Pasadena, Calif.*), **Lead isotopes in sea wa and marine sediments.** *Journal of Marine Research,* New Haven, Conn., 17:120–127, **19** 5 tables, 11 refs. **DWB, DLC**—The lead concentration obtained from sea water samples of S Juna Channel, Washington was 0.2 μg/1 or less. Lead isolated from Pacific and Atlantic pela clay sediments shows an isotopic composition similar to that of manganese nodules from respective oceans. The Pb^{206} content in the Atlantic lead was more abundant than that in Pacific lead. This finding agrees with the postulate that the Atlantic lead was derived from ro which contained high proportions of relatively young basalts. *Subjcct Headings:* **1. Lead sea water 2. Pelagic sediments 3. Lead isotopes in sea water 4. San Juna Channel, Was ington.**—*Author's abstract.*

12M–701 551.464:551.352:546.7

Graham, John W. and Cooper, Susan C. (*Woods Hole Oceanog. Inst.*), **Biological origin manganese-rich deposits of the sea floor.** *Nature,* London, 183(4667):1050–1051, April **1959.** 2 refs. **DWB**—Brief report supporting the previously advanced argument that m ganese-rich deposits from the sea floor result from biological rather than inorganic process. T observation was made by analysis of about 50 gm light tan mud taken Dec. 18, 1958 at 5139 of water at lat. 34°48′N, long. 60°30′W. The bottom temperature was 2.3°C. *Subject Heading* **1. Marine sediments 2. Manganese deposits 3. Marine biology.**—*W.N.*

NITROGEN

12M–702 551.464:546

Benson, Bruce B. and Parker, Peter D. M., **A new technique for dissolved gas analy with application to the study of dissolved nitrogen in aerobic ocean waters.** *Internatio Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. AAAS, **1959.** p. 879–880. In English and German. **DWB** (551.46082 I61pr)—The techniq of mass spectrometery designed to differentiate between physical effects and biological or chemi effects by using a reference gas, argon, which is influenced only by physical effects, were emplo for the analysis of dissolved nitrogen in the oceans. For the samples analyzed, results in aero waters show that nitrogen is conservative within narrow limits. *Subject Headings:* **1. Dissolv gases in sea water 2. Nitrogen in sea water 3. Aerobic environments.**—*I.S.*

12M–703 551.464:546.175:593

Brandhorst, Wilhelm (*Institut für Meereskunde, Kiel Univ.*), **Nitrite accumulation in North-East Tropical Pacific.** *Nature,* London, 182 (4636):679, Sept. 6, **1958.** fig., 4 re **DWB**—Sea water samples from the surface and down to 800 m were analyzed in order to stu the decay of planktonic matter. Between 8°N and 21°N off the American coast and betw 150 m and 1000 m depth there is a layer of water with close to zero oxygen content and with aximum of nitrite; values up to 2.5 gm/at/1 are graphed. Nitrate maxima occur only in ater with < 0.10 cm^3/1 oxygen, indicating that the occurrence might result from a reduction of trate to nitrite. *Subject Headings:* **1. Sea water chemistry 2. Nitrite in sea water 3. arine ecology 4. Northeast Tropical Pacific.**—*W.N.*

12M–704 551.464:546.17

Brandhorst, Wilhelm (*Inst. Meereskunde, Kiel, Germany*), **Nitrification and denitrification the eastern tropical North Pacific.** *International Oceanographic Congress, 1st, N. Y., 1959, reprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 881–883. fig. Spanish ummary p. 883. **DWB** (551.46082 I61pr)—Nitrite analyses were made in waters off the Mexican nd Central coast during two oceanographic expeditions of the Scripps Institution of Oceanography SCOPE Expedition, 1956) and of the Inter-American Tropical Tuna Commission (Island Curent Survey, 1957). The processes of nitrification and denitrification are explained and the ssociated findings of the two expeditions are described and graphically presented. *Subject Headgs:* **1. Nitrite in sea water 2. SCOPE Expedition 1956 3. North Pacific Ocean.**—*I.S.*

12M–705 551.464:546.17:546.293

Richards, Francis A. and Benson, Bruce B., **Nitrogen/argon and nitrogen isotope ratios anaerobic marine environments.** *International Oceanographic Congress, 1st, N. Y., 1959, reprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 896–897. In English nd German. **DWB** (551.46082 I61pr)—The Nitrogen/Argon ratios observed in the oxygenree waters of Cariaco Trench, in the Caribbean Sea and in the Dramsfjord, an arm of the slofjord in Norway correspond to excesses of 2 to 3% of the total free nitrogen. An analysis f data from the Cariaco Trench indicates the probability that the free nitrogen biologically formed riginates from the reduction of nitrate and nitrite. *Subject Headings:* **1. Nitrogen/argon ratios Nitrogen isotope ratios 3. Anaerobic marine environments 4. Cariaco Trench, Caribbean ea 5. Oslofjord, Norway.**—*I.S.*

OXYGEN

12M–706 551.464:546.211(262)

Kitamura, Hiroyuki (*Kobe Marine Obs.*), **Chemical oceanography of the North Pacific, t. 4, Oxygen distribution in the north Pacific Ocean.** *Umi to Sora* (Sea and Sky), Tokyo, 4(4):71–75, **1958.** 3 figs., 6 refs. In Japanese; English summary p. 71.. **DLC**—Organic roductivity may be estimated by oxygen distribution in the ocean. From the study of the disribution of oxygen at the sea surface and in the maximum layer in the north Pacific differences amounts of oxygen could not be found in the cold and warm water areas, but were found in ne boundary area between different water masses. It is shown that organic production takes lace in the eastern sea of Honshu, northeastern part of central Pacific and in the sea west of the alifornia Peninsula. The author draws the conclusion that the differences in amount of oxygen the sea surface and in the maximum layer is useful as an indication of potential organic productivity in the north Pacific Ocean. *Subject Headings:* **1. Oxygen in sea water 2. Organic roductivity 3. North Pacific Ocean.**—*K.C.*

12M–707 551.464:546.211

Miyake, Yasuo and Saruhashi, Katsuko (*Met. Res. Inst., Tokyo, Japan*), **On the vertical istribution of the dissolved oxygen in the ocean.** (In: UNESCO Symposium on Physical ceanography, Tokyo, Oct. 1955, **Proceedings,** pub. **1957.** p. 156–159. 3 figs. French sumary p. 156). **DWB**—The main factors determining the vertical variation of dissolved oxygen nd the occurrence of the oxygen minimum layer are the local productivity and the vertical ensity distribution of the subsurface waters. The oxygen depletion is closely related to the ncrease in CO_2 (from decomposition of organic matter). *Subject Headings:* **1. Dissolved oxyen in sea water 2. Vertical density distribution 3. Oxygen-minimum layer.**—*E.Z.S.*

12M–708 551.464:546.21

Okubo, Akira, **An estimation of the average compensation depth by a study of the ertical distribution of dissolved oxygen.** *Records of Oceanographic Works in Japan,* Tokyo, .s. 5(1):51–59, Feb. **1959.** 2 figs., 4 tables, 9 refs., 17 eqs. **DWB**—By a study of the vertical istribution of dissolved oxygen on the basis of the diffusion equation in which an annual variaon of the vertical eddy diffusivity is taken into consideration, the author estimates the average nnual depth of compensation at the ocean weather stations "T" and "X." The computed results re found to be reasonable in comparison with other experimental and empirical information. In ddition to this, the relationship between the depth of compensation and that of being just suturated with oxygen is discussed. *Subject Headings:* **1. Oxygen distribution 2. Vertical eddy iffusion.**—*Author's abstract.*

12M–709 551.464:546.21(2

Okubo, Akira (*Japan Met. Agency*), **The distribution of dissolved oxygen in the nor western part of the North Pacific Ocean in the aspect of physical oceanography, Pt General features of the oxygen distribution (I).** *Oceanographical Magazine*, Tokyo, 10(137–156, June **1958.** 13 figs., 9 refs. **DLC**—As a preliminary report on studies on dissol oxygen in the northwestern part of the North Pacific from a standpoint of physical oceanogra the author describes the general features of the spatial distribution of oxygen in waters ab upper abyssal depths on the basis of recent data observed in a cooperative survey in the sum of 1955 ("Norpac Expedition"). *Subject Headings:* **1. Oxygen distribution in sea wa 2. Northwestern North Pacific.**—*Author's abstract.*

12M–710 551.464:546.211:58

Okubo, Akira (*Japan Met. Agency, Tokyo*), **A note on the super- and under-saturation dissolved oxygen in surface waters (The distribution of dissolved oxygen in the sea east Honshū, Japan, Pt. 2).** *Oceanographical Society of Japan, Journal,* 13(4):139–144, Dec. 19 5 figs., 5 refs., 10 eqs. **AGO**—In general the oxygen content in the sea surface water ha tendency to come close to a saturation value computed from temperature and chlorinity. S an ability of adjustment depends primarily on the rate of exchange of oxygen between the surface and the atmosphere, which may not be so rapid under natural conditions that we of encounter surface waters whose oxygen contents have deviated from the saturation values. other cause of the discrepancy from a saturation value may arise from the biological activ In the present note the author examines the relationship between the super- and under-saturat values of oxygen and the amount of phytoplankton in surface waters, obtained in sea area of Japan. Through the theoretical discussion about the rate of exchange of oxygen across sea surface, it is evident that the spring bloom of phytoplankton plays an important role on appearance of supersaturation of oxygen in the surface water. *Subject Headings:* **1. Phys properties of surface water 2. Oxygen content of surface water 3. Phytoplankton in s face water 4. Sea of Japan.**—*Author's abstract.*

12M–711 551.464:

*†Richards, Francis A. (*Woods Hole Oceanog. Inst., Woods Hole, Mass.*), **Oxygen in ocean.** *Geological Society of America, Memoir,* No. 67, Vol. 1:185–238, Dec. **1957.** 11 fi 11 tables, bibliog. p. 232–238, eqs. **DLC** (QH542.N3)—A "review" article giving latest infor tion and quantitative data on solubility of gases in sea water, exchanges across sea surf photosynthetic production of oxygen, biological consumption of O_2 and other chemicals, origin the oxygen-minimum zone relationship between O_2 and populations of sea, O_2 in various oce (Arctic, Atlantic, Caribbean, Mediterranean and Black Seas, Labrador Sea, Sargasso Sea, Ind Ocean and Red Sea, the Pacific Ocean, Sea of Japan, Dutch East Indies, and finally the N Pacific and Bering Sea). An extensive list of references is appended. *Subject Headings:* **Oxygen in sea water 2. Oceanography bibliographies 3. Oceanology reviews.**—*M.R.*

12M–712 551.464(2

Bogoiavlenskiĭ, A. N., **Osobennosti raspredeleniia kisloroda, fosfatov i kremnekislot antarkticheskikh vodakh.** [Certain peculiarities of the oxygen, phosphates and siliceous a distribution in Antarctic waters.] *Leningrad. Arkticheskiĭ i Antarkticheskiĭ Nauchno-Issle vatel'skiĭ Institut, Informatsionnyĭ Biulleten' Sovetskoĭ Antarkticheskoĭ Ekspeditsii,* No. 3:19– **1958. DWB** (P 3:1958)—The distribution of oxygen, phosphates and silicic acid with res to Antarctic water dynamics exhibits a well-marked latitudinal zoning. Antarctic waters betw the divergence and convergence zones are characterized by high concentration of oxygen and ph phates and a minimum of oxygen occurs at depths of 500–750 meters. The variations of hyd chemical element distribution, particularly of phosphates, may be attributed to the thaw of *Subject Headings:* **1. Chemical content of Antarctic waters 2. Antarctic Ocean.**—*S.N.*

12M–713 551.

Rotschi, Henri, **Oxygen, inorganic phosphate and carbon dioxide relationships in Coral Sea.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts papers.* Issued Wash., D. C., AAAS, **1959.** p. 899–901. eqs. In English and French. **DV** (551.46082 I61pr)—Studies were made of the content of dissolved oxygen, inorganic phosph and total carbon dioxide in sea water during the "Astrolabe" and "Boussole" cruises of "Orsom III," research vessel of the Institut Français d'Océanie, in May/June and Nov. 19 The results show a highly significant positive correlation between oxygen and phosphate oxygen and total carbonate dioxide. *Subject Headings:* **1. Oxygen in sea water 2. Carb dioxide in sea water 3. Phosphate in sea water 4. Coral Sea.**—*I.S.*

12M–714 551.464:546.21

Rakestraw, Norris W. (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Particulate matter in e oxygen-minimum layer.** *Journal of Marine Research*, New Haven, Conn., 17:431, **1958.** figs., 6 refs. **DWB, DLC**—It appears necessary to abandon the concept that particulate matter ccumulates in the oxygen-minimum zone of the ocean. Water samples were collected five times uring 1937–38 from three key stations: Station A, on the continental shelf about 30 miles south- ast of Montauk Point; Station B in the slope water northwest of the current of the Gulf Stream; tation C, in the Sargossa Sea southeast of the Gulf Stream and in 1939 at Stations B and C. everal of the theoretical pictures proposed (SEIWELL, 1938; WATTENBERG, 1939) postulate an ccumulation of organic particulate matter at the level of greatest stability, near the bottom of e thermocline, and it has been supposed that this is important in determining the depth of the xygen-minimum zone. However, the observations show no such relation. The vertical distribu- on of particulate matter is irregular but, although it seems to be more abundant near the surface ere is certainly no indication of any accumulation in the zone of low oxygen. *Subject Head- gs:* **1. Oxygen-minimum layer 2. Particulate matter in sea water 3. Sargossa Sea 4. ulf Stream.**—*E.Z.S.*

12M–715 551.464:546.21:594.8:551.461.8

Lowenstam, Heinz A., **O^{18}/O^{16} ratios and Sr and Mg contents of calcareous skeletons of ecent fossil brachiopods and their bearing on the history of the oceans.** *International ceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAS, **1959.** p. 71–73. table. In English and German. **DWB** (551.46082 I61pr)—Data btained on the O^{18}/O^{16} ratios and $SrCO_3$ ratios, and $MgCO_3$ contents in fossil articulate brachio- od shells of Pliocene, Cretaceous, Permania, Pennsylvanian and Mississippian ages are tabulated. he temperature values in six samples of different geologic ages of the O^{18}/O^{16} and Sr/Ca ratios ow an agreement within 1°C to 3°C. In one of the Mississippian samples the temperature value or the $MgCO_3$ content is similarly close to the values of the two other properties. It is evident rom this that the composition of the sea water has remained essentially the same over the time an covered by the samples. *Subject Headings:* **1. Chemistry of sea water 2. History of ea water 3. Oxygen $^{18/16}$ ratios on marine fossils 4. Strontium carbonate in marine fossils . Magnesium carbonate in marine fossils.**—*I.S.*

Perchlorate and Phosphate

12M–716 551.464:546.137

Becking, L. G. M. Baas; Haldane, A. D. and Izard, David (*all, Commonwealth Sci. and Ind. esearch Organization and Bureau of Mineral Resources, Canberra*), **Perchlorate: an important onstituent of sea water.** *Nature*, London, 182(4636):645–647, Sept. 6, **1958.** 2 tables, 15 refs. **WB**—Perchlorate represents the highest oxidation level of the inorganic environment, which is ell to take into consideration in any study on oxidative weathering in saline environments. Com- arative results obtained on chromatograms for various sea water samples indicate the content of erchlorate to be highest near the coast, decreasing with inland distance and with depth in the sea. erchlorate concentrations in p.p.m. at various locations and depths are presented in tabular form. *ubject Headings:* **1. Chemistry of sea water 2. Perchlorate in sea water.**—*W.N.*

12M–717 551.464:546.185(265)

Kitamura, Hiroyuki, **On the distribution of phosphate in the Western North Pacific.** *obe, Japan. Marine Observatory, Memoirs*, 12(1):15–20, Feb. **1958.** 5 figs., 6 refs. **DWB**—he distribution of inorganic phosphate phosphorus both on isopycnic surfaces and in vertical ections has been studied on the basis of data made available from the observation conducted in e summer of 1955, or the operation NORPAC. It is proved that along the isopycnic surface e characteristics in distribution are simple in the open ocean, while they are complicated in the eas adjacent to the land. On the other hand, it is made clear that the vertical distribution of osphate on the polar front varies systematically according to the longitude. *Subject Headings:* **Phosphate in sea water 2. Western North Pacific.**—*Author's abstract.*

12M–718 551.464:546.185:551.468.6

Pomeroy, Lawrence R. and Bush, Francis M. (*both, Univ. Ga. Marine Inst., Sapelo Island, a.*), **Regeneration of phosphate by marine animals.** *International Oceanographic Congress, t, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAS, **1959.** p. 893– 5. table. French summary p. 894–895. **DWB** (551.46082 I61pr)—The importance of animal cretions in the phosphorus content of an estuary is evaluated. The area studied is Doboy ound with a high-tide area of 125 km^2, of which 88 km^2 are intertidal marshes. The rate of osphate production was estimated in the laboratory, using freshly-collected specimens. The ata, presented in tabular form, suggest that animal excretions may produce all the phosphate required by plant populations other than *Spartina*. *Subject Headings:* **1. Phosphate in estuar 2. Doboy Sound, Ga.**—*I.S.*

SALT

12M–719 551.464(262

Skopintsev, B. A., **Osobennosti soderzhaniia i raspredeleniia soleĭ v vodakh Chern moria.** [Content and distribution of salts in Black Sea water.] *Priroda,* Moscow, No. 12:87– Dec. 1959. 2 figs., 2 tables, 5 eqs. **DLC**—The waters of the Black Sea differ from the wat of open oceans and seas with regard to their salt and gaseous constituents. The salt content the Black Sea along the vertical increases with depth, the maximum variation occurring in 0–150 m. layer. In the Black Sea the values of the ratios of all salt components to Cl% exclud the bases (Na + K) is greater than corresponding values computed for oceanic waters. M marked differences are manifested by the ratios $HCO_3/Cl\%$, less for Ca/Cl% and still less Mg/Cl%; the ratio $SO_4/Cl\%$ is greater than in ocean water only up to 300 m and then it decreases. The differences in the ratios of salts to Cl% which are greatest for HCO_3 and Ca smallest for Na + K are accounted for by the inflowing river waters which manifested themsel most strongly in the upper 150 m layer. In contrast to the ocean, in the Black Sea the ra do not remain constant from surface to the bottom except for Na + K/Cl%. The greatest va tion along the vertical are shown by HCO_3/Cl which diminishes from the surface up to 100–20 and then increases to the bottom, and by the ratio $SO_4/Cl\%$, which is lower than in oceanic wa The decrease of $SO_4/Cl\%$ is a result of the action of bacteria which, in the absence of free remove the oxygen from the sulfate radical. In the process of interaction of H_2S, HS, H_2 and HCO_3 ions accumulate hydrogen sulfide and bicarbonate ions at the bottom so that the r $HCO_3/Cl\%$ increases in contrast to the surface layers, where the magnitude of the basic chlor coefficient is lower. The salt regime of the Black Sea and oceans is compared; the chemistry SO_4 decomposition is discussed and data on mean chemical composition and salinity of waters the Black Sea and the ocean ratio of individual components of salt composition of waters of Black Sea to the chlorine content etc. are presented. *Subject Headings:* **1. Salt in sea wa 2. Chemistry of sea water 3. Bacterial effects on sea water 4. SO_4 in sea water 5. Hyd gen sulfide in sea water 6. Black Sea.**—*I.L.D.*

12M–720 551.

Stommel, Henry; Arons, Arnold B. and Blanchard, Duncan, **An oceanographical curios the perpetual salt fountain.** *Deep-Sea Research,* London, 3(2):152–153, Feb. **1956. DL** "In many tropical and subtropical regions of the ocean the warm surface layers have a sali exceeding that found in the colder waters of polar origin below. If a long tube were lowe from the surface to depth of low salinity water and the deep water were slowly (to allow it warm) pumped to the surface through the tube, and the pump then disconnected, the water wo continue to flow, by itself, forever." The same could be done in reverse direction. A laborat experiment is described to demonstrate this effect. Practical applications are improbable (poss pumping up of nutrient rich water for fish; or waste removal). *Subject Headings:* **1. Perpet salt fountain 2. Salt in sea water.**—*G.T.*

12M–721 551.

Groves, Gordon W., **Flow estimate for the perpetual salt fountain.** *Deep-Sea Resea* London, 5(3):209:214, March **1959.** 2 figs., table, 5 refs., 9 eqs. **DWB, DLC.** Reprinted *California Univ. Scripps Institution of Oceanography. Contributions, 1959,* issued **1960.** p. 16. **DWB** (551.46 C153co)—Calculations were made to estimate the rate of flow in the " petual salt fountain" (STOMMEL et al., 1955. *See* 12M–720 this bibliog.). STOMMEL pointed the perpetual salt fountain as an interesting oceanographical curiosity that might possibly be u for pumping up nutrient-rich deep water to the surface for ocean farming applications. estimates obtained by the author seem to be small reward for the effort involved and he conclu that STOMMEL et al. were correct in describing the perpetual salt fountain as being an ocea graphical curiosity. *Subject Headings:* **1. Ocean farming potentialities 2. Perpetual fountain 3. Salt in sea water.**—*E.Z.S.*

12M–722 551.556.4:551.574.11:551.

Sugawara, Ken (*Nagoya Univ., Japan*), **Syn-bubble-bursting fractionation of sea s ejection of spray droplets with a salt composition different from that of the main sea wa when a foam bursts** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of stracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 875–877. fig., table. German s mary p. 877. **DWB** (551.46082 I61pr)—Results of an experiment are tabulated in which clea and moistened air was bubbled through a sea-water sample on to a glass filter and a series bottles with distilled water was arranged to collect and absorb the emitted spray. An examina the composition of the spray solution showed the salt composition of the spray to be different om that of the original sea water. *Subject Headings:* **1. Salt in sea water 2. Sea spray salt.** *-I.S.*

12M–723 551.513:551.574.11:551.464:546.13

Eriksson, Erik (*Internatl. Met. Inst., Stockholm*), **The yearly circulation of chloride and ılfur in nature: meteorological, geochemical and pedological implications, Pt. 1.** *Tellus,* ockholm, 11(4):375–403, Nov. **1959.** 3 figs., 3 tables, 3 eqs. **DLC**—The discussion in this ıper is mainly concerned with the release and transport of sea salts from oceans into continental eas. The chief chemical and physical properties of the atmosphere are briefly described. A orough review of the investigations concerning the sea salt particles and their generation is ade. The subsequent section deals with the yearly circulation of sea salts between oceans and ntinents as revealed by the use of geochemical data. Another section is devoted to a considera- on of mechanisms of transfer to and removal by the ground of sea salt components. This is llowed by considerations of the possible separation of sea salt components from sea salt particles. xisting data on precipitation of chloride and sulphur over land and their circulation are also scussed. The two last sections consider briefly some pertinent problems in hydrology and soil ience. *Subject Headings:* **1. Salt in sea water 2. Chloride in sea water 3. Sulfur in sea ater 4. Atmospheric chemistry.**—*I.S.*

12M–724 551.464(262.5)

*†Skopintsev, B. A.; Cubin, F. A.; Vorob'eva, R. V. et al., **Soderzhanie glavnykh kom- onentov solevogo sostava v vode Chernogo moria i nekotorye voprosy obmena vod.** Content on the main salt components in the water of the Black Sea and certain problems of ater exchange.] *Akademiia Nauk SSSR. Morskoĭ Gidrofizicheskiĭ Institut, Trudy,* 13:89–112, **958.** 23 tables, 28 refs. **DLC, DWB** (M(055) A313tr)—At 5 points on the open part of the lack Sea, 55 water samples were taken from the surface to the bottom in order to determine the inciple salt constituents of the water; the total Ca^{++} and Mg^{++} and the Ca^{++} separately were termined by the method involving titration of a solution of the acid sodium salt of ethylenedi- nino tetraacetic acid, with the eriochrome indicator for the Calcium ions and murexide for the agnesium ions. The results obtained are presented in tables giving chloride content (in per cent) the water of the Black Sea (1954–1955); SO^{--} content (g/kg), HCO$_3^-$ content (in equiv/kg) ntent of total anions (g-equiv/kg) content of Ca^{++} + Mg^{++} (in equiv/kg) content of Ca^{++} (g/kg), ntent of Mg^{++} (g/kg) and content of Na$^+$ + K$^+$ (in equiv/kg) in the water of the Black Sea. ata are also presented on the average content of cations and anions in the Black Sea, on the tio of the ion components to the chlorine content, etc. The ratio of Na + K/Cl varies slightly ong the vertical; corresponding ratios for other constituents vary considerably, especially in e 0–150 m layer where their value decreases gradually. From 200 m on the ratio SO$_4$/Cl creases to the very bottom, the ratio HCO$_3$/Cl increases to the bottom and the ratios Ca/Cl ıd Mg/Cl remain practically constant to 1500 m and then diminish somewhat. In comparison ith oceanic water the mean magnitude of the ratio of ions to chlorine per cent is greater along e vertical in the Black Sea for all ratios except that for SO$_4^{--}$; the greatest deviation is shown HCO$_3^-$; for Na + K the ratios in the Black Sea are practically identical with the oceanic tio. The average salt composition of the rivers of the Black Sea basin (computed in equivalent r cent) are close to the mean composition of oceanic water; in the 0–150 layer the differences e somewhat larger. The mean saline composition of the Black Sea at depths of 0–150 and 00 m was computed from the mean saline composition of the rivers of the Black Sea basin and om that of the Sea of Marmora. The analytical data are close to the values computed for all mponents except sulfates (below 150 m), and alkalinity along the entire vertical. The annual flow of water from the Sea of Marmora calculated from the water-saline balance constitutes 5 km^3. *Subject Headings:* **1. Water exchange 2. Salt in sea water 3. Chemistry of sea ater 4. Black Sea. I. Vershinina, O. A.**—*I.L.D.*

SILICATE

12M–725 551.464:549.6:546.28(266)

Kitamura, Hiroyuki (*Kobe Marine Obs.*), **Chemical oceanography of the North Pacific, t. 3, Seasonal variation of the silicate silicon in the Kuroshio.** *Umi to Sora* (*Sea and Sky*), okyo, 34(3):51–57, **1958.** 6 figs., 2 tables, 6 refs. In Japanese; English summary p. 51. **LC**—A discussion of the relations between seasonal variation of the silicate silicon content and eanographic conditions in the Kuroshio. The Kobe Marine Observatory made oceanographic vestigations in the south off Honshū from May 1954 to 1955. The rate of variation between 54 and 1955 was positive in the coastal area in summer, and negative in the open ocean in nter. The statistical relations between inorganic phosphate phosphorus and silicate silicon from 54 to 1955 were obtained and the regression equations which it has yielded are P = 0.08 + 0.03

Si and Si = 1.22 + 29.5P. The horizontal gradient of the silicate at each depth was steep a the Kuroshio current. *Subject Headings:* **1. Chemistry of sea water 2. Silicate silicon in water 3. Kobe Marine Observatory 4. Kuroshio Current.**—*K.C.*

12M–726 551.464:5

Richards, Francis A. (*Woods Hole Oceanog. Inst.*), **Dissolved silicate and related proper of some western North Atlantic and Caribbean waters.** *Journal of Marine Research,* Haven, Conn., 17:449–465, **1958.** 5 figs., table, 34 refs. **DWB, DLC**—Dissolved silicate, p phate, nitrate, and oxygen as well as salinity and temperature were observed in several reg around the Antilles Arc and in the Woods Hole-Bermuda area. It is shown that silicat generally in low concentration in surface waters where its ratio to phosphate, nitrate and ox consumption is variable. At intermediate depths, silicate, phosphate and nitrate regeneration oxygen consumption (AOU) proceed in the ratios, by atoms, of $\Delta AOU:\Delta Si:\Delta N:\Delta P = 270:$ 16:1. In some of the water masses, silicate, nitrate and phosphate occur in these same r but are in excess of the amount of regeneration expected from the amount of oxygen consump However, silicate is clearly and linearly related to biological processes. In other water ma notably in deep water of the North Atlantic, the Puerto Rico Trench and the eastern Carib Sea, and in anaerobic water of the Cariaco Trench, there are higher concentrations of sil than would be expected from the amounts of phosphate present. These may originate from in re-solution of skeletal remains of diatoms or from resolution of bottom deposits followed by up diffusion. *Subject Headings:* **1. Chemistry of sea water 2. Silicates in sea water 3. Wes North Atlantic 4. Caribbean Sea.**—*Author's abstract.*

Sulphate

12M–727 551.351:551.464:54

Obara, Nobuhiko, **On the significance of SO_4-anomaly as an indicator of stagnatio sea water in a bay.** *Journal of Geography,* Tokyo, 60(4):7–9, **1951.** fig., table, 5 refs. Japanese; English summary. **DLC**—The ratio of sulfate to chlorine is usually constan ordinary pelagic water. The author investigated the water in Oct. 1940, in several bays (H Mera, Arari, Uchiura, Nakagi, Nagatsuro inlet, etc.). On Izu Peninsula the ratio (SO deviated from the standard value) and showed anomalies, because sulphate was consume sulphate-reducing bacteria. If ventilation of sea water were free, the anomaly could not o Stagnation may occur where a sill prevents circulation or transport between bay and sea w If the relationship between the anomaly and inorganic sulfur contained in bottom material understood, the study of sedimentary rocks would reveal the sedimentary environment (anae condition) under which they formed. *Subject Headings:* **1. Sulfates in sea water 2. Izu Pe sula, Japan.**—*K.C.*

12M–728 551.464:546.22 551.577.13:54

Östlund, Göte (*Geol. Surv. Sweden, Stockholm*), **Isotopic composition of sulfur in pre tation and sea water.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprint abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 872–873. In English and Ger **DWB** (551.46082 I61pr)—Eighteen samples of precipitation and three sea-water samples analyzed. The precipitation samples were taken at different places between the Swedish Coast and Stockholm during February–October 1957 and on the Gulf Coast of Texas and on Pacific Coast of Washington State. Sea-water samples were taken in the Gulf of Bothnia Gothenburg and in the Arctic Sea. The results show a large difference in the sulfur compos of sulfate in the sea and in precipitation leading to the conclusion that sea-water cannot be main source of sulfur brought down by rain and snow. *Subject Headings:* **1. Sulfur in sea w 2. Sulfur in precipitation.**—*I.S.*

12M–729 551.464

Rotschi, Henri, **Specific alkalinity in the Coral Sea.** *International Oceanographic gress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, p. 822–824. French summary p. 823. **DWB** (551.46082 I61pr)—500 measurements of alkalinity were made on the water masses of the Northeast Coral Sea, from the surface dow 1000 m, during the "Astrolabe" cruise of the RIV Orsom III in May/June 1958. The calcul of the total alkalinity, carbonate alkalinity and concentration in carbonate and bicarbonate was made. The results of the studies in correlation with depth, salinity, temperature, and various available chemical properties of the water, are discussed. *Subject Headings:* **1. Alkali of sea water 2. Coral Sea.**—*I.S.*

Salinity-Chlorinity-Density

12M–730 551.463/

Carritt, Dayton E. and Carpenter, James H., **The composition of sea water and the sali chlorinity-density problems.** *National Research Council, Wash., D. C., Publication* No.

9. p. 67–86. 3 figs., table, 12 refs., 2 eqs. **DWB** (551.4601 C748co)—Some concepts in mical and physical oceanography are reviewed and discussed. Different interpretations of the stancy of the relative proportion of constituents in sea water are considered. Although the iations of the ratios are small, they are nearly constant. Included in the discussion are refer-es to the HMS "Challenger" and DITTMAR's 77 samples, also chlorinity-gravity relationship and itations are considered along with the chlorinity-salinity relationship. *Subject Headings:* **Chemistry of sea water 2. Salinity-chlorinity-density 3. Physical oceanography.**—*W.N.*

12M–731 551.464:546.13

Laevastu, Taivo and Fleming, Richard H., **Chlorinity of the interstitial waters in sediments m Lake Washington Ship Canal and the flow of fresh and salt water through the sedi-nts.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* ued Wash., D. C., AAAS, **1959.** p. 967–970. 3 figs. In English and German. **DWB**—1.46082 I61pr)—The possible exchange of interstitial water with the bottom water above the iments is studied. Whether or not the interstitial water in the sediments presents the same racteristics as the bottom water during the deposition of corresponding layer of the sediment is examined. A map is presented of Lake Washington Ship Canal system and location of ions. Chlorinity of interstitial water and results of laboratory experiments on the flow of er through sediment are presented in graphic form. *Subject Headings:* **1. Chlorinity of inter-ial water 2. Lake Washington Ship Canal, Seattle, Wash.**—*I.S.*

12M–732 551.464.083:621.317.7:551.326.7

Suzuki, Yosio and Ishida, Tamotsu, **The vertical distribution of chlorinity of sea water der the coastal level-ice at Monbetsu measured by new instruments.** *Low Temperature ence, Ser. A, Physical Sciences,* Sapporo, Japan, No. 17:109–121, **1958.** 11 figs., 4 refs., 8 eqs. glish summary p. 120–121. **DWB, DLC**—As the concentration of sea ice increases, the effect wind on the process of the mixing of sea water decreases and the intensity of mixing diminishes, least in the upper layer of the sea where the mixing is considered to be due mainly to wind ion. Therefore, if a mass of fresh water were supplied to the region covered sufficiently with ice to prevent any measurable effect of wind activity, it would stratify stably making a layer low salinity. If sea ice again grows after such a layer of low salinity has been made, the ly grown ice must be considered to be made of water of low salinity of that layer and not of original high salinity sea water. This fact becomes very important when one studies the cture and composition, especially the brine content, of sea ice, because they are highly de-dent on the salinity of the water of which the ice has been made. Now, such a layer of low nity is said to be found under the so-called ice island in the Arctic Sea late in summer and ly in autumn after a fresh water mass has been supplied by melting of a part of the ice island lf. But more a common example is found in any coastal region covered by sea ice, only if re exists some drainage of land water (rivers etc.). The thickness of such layer depends on amount of fresh water supply and, when the latter is small, may be so thin that usual oceano-phic observation fails to reveal it. Two new instruments, the electrosalinometer and the tion-type micro water sampler, were devised by the authors for observing a thin layer of low nity under sea ice. They were tested at Monbetsu on the Okhotsk coast of Hokkaido in ruary 1958. Both proved to be very useful. A thin layer of low salinity was found under level ice in the inner port of Monbetsu. Rather detailed descriptions of the instruments are tained in this paper. Emphasis is laid on the order of accuracy of the electrosalinometer. ative error of the values of chlorinity observed by it seems to be less than ± 2.5% in the range 7–20‰ Cl (absolute error less than ± 0.4‰ Cl at 15‰ Cl). Observed vertical distributions of rinity and temperature are shown. These distribution curves are briefly analyzed. The origin such distributions is partly attributed to the existence of the upward flow of water in the ndary layer between the upper low-saline layer and bottom high-saline original sea water. *ject Headings:* **1. Chlorinity of sea water 2. Salinity of sea water. 3. Sea ice-salinity rela-ships 4. Monbetsu, Japan.**—*Authors' abstract.*

12M–733 551.464(265.4)

Okuda, S. (*Fac. of Science, Okayama Univ.*), **On the decrease of salinity in Kojima Bay r closing of outlet.** *Journal of Agricultural Meteorology,* Tokyo, 14(4): 145–150, March 9. 5 figs., 6 refs., 2 eqs. In Japanese; English summary p. 30. **DWB**—The value of salinity ojima Bay decreased promptly for about 100 days after closing its outlet on account of inflow resh water from rivers and outflow of sea water through sluice gates. This study was designed nvestigate factors which control the exchange phenomenon of fresh and sea water in the bay sidering of observed values of salinity, records of water level and data of meteorological ele-ts. The vertical mixing by wind wave and horizontally asymmetric distribution of salinity Coriolis force were not significant in the bay. The mixing of fresh and sea water in stratified

flow at early stages depends on the salinity difference between upper and lower layers, and
author assumed a linear relation between the ratio r (salinity of outflow water/mean salinit
the bay) and mean salinity S, $r = l - K(S\text{-}a)$ (a, salinity of inflow water; K, constant paramet
Under this asumption the solution of the differential equation for salinity change was given
the formula.

$$S = \frac{\frac{C}{K} - ae^{V(Q/V)t}}{C - e^{V(Q/V)t}} \left(P = 1 - K_aC = \frac{KS_0 - K_a}{KS_0 - 1} \right)$$

(S_0, initial salinity; Q, flow rate; V, volume of water in the bay; t, time after closing of out
This formula can express the tendency of observed salinity change more appropriately than
formula suggested by JANSEN who assumed constant r. *Subject Headings:* **1. Salinity of**
water 2. Kojima Bay, Japan.—*Author's summary.*

12M–734 551
Lyman, John (*Nat. Science Foundation, Wash., D. C.*); Barquist, Richard F. (*U.S.A. M*
Res. Lab., Ft. Knox, Ky.) and Wolf, A. V. (*Univ. of Ill., College of Medicine, Chicago*), **A**
method for direct determination of salinity. *Journal of Marine Research,* New Haven, Co
17:335–340, **1958.** 2 tables, 3 refs. **DWB, DLC**—The solid material obtained upon fre
drying sea water is not a true measure of salinity since it contains 9 or 10% water of crystall
tion, the exact content being a sensitive function of temperature and humidity. The resi
water is determinable with Karl Fischer reagent, although the method is not yet capable of y
ing salinity with the precision hitherto obtainable through the Knudsen titration. Total salt (
found by freeze-drying and determining residual water with Karl Fischer reagent, is the propor
of solid material when all of the bicarbonate is dehydrated at the rate of one water molecule
bicarbonate molecule and when the boric acid is dehydrated at the rate of three water molec
per boric acid molecule; however, the fate of the organic matter is uncertain. Neglecting org
matter, the theoretical ratio of Σ' to S for ordinary oceanic chlorinities should be about 1.0
compared with the ratio Σ' to S of 1.0046 found by LYMAN and FLEMING. *Subject Head*
1. Salinity measurement techniques.—*Authors' abstract.*

12M–735 551.464:551.482.2
Borishanskiĭ, L. S., **Raspredelenie solenosti v predust'evom prostranstve moria.** [Sal
distribution in the sea at the mouth of a river.] *Moscow. Gosudarstvennyĭ Okeanografich*
Institut, Trudy, No. 42:128–141, **1958.** 3 figs., 4 tables, 5 refs., 35 eqs. **DLC**—The au
presents a method for computing the distribution of salinity near the mouth of a river.
method is based upon the fact that the river spreads out on issuing from the river mouth,
result of turbulent diffusion freshens the sea water with which it comes into contact. W

increasing distance from the mouth the concentration of river water, i.e., its amount (weigh
volume), percent weight (volume) of sea water diminishes and its salinity increases. Fro
knowledge of the river discharge coefficient of turbulent diffusion, velocity and direction of
current it is possible to determine the distribution of salinity in the sea near the mouth.
cases are considered: (1) a river with a single armed narrow mouth, it is considered as a
stantly acting current source situated at the point where the river flows into the sea; and (
river with a wider mouth; it is considered as a linear source situated along the sea area of
estuary. Equations are devised for computing the concentration of river water for both insta
and the observed and calculated data are compared. Observations in the estuary area of the V
and Kuban Rivers are presented. *Subject Headings:* **1. Salinity of sea water 2. Volga R**
U.S.S.R. 3. Kuban River, U.S.S.R.—*I.L.D.*

12M–736 551.464(28
Borishanskiĭ, L. S., **Opredelenie zony raspresniaiushchego deistviia reki v predust'e**
prostranstve moria. [Determining the salinity reducing effect of river water in the pre-estua
area of the sea.] *Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Institut, Trudy,* No. 47:38
1959. 2 figs., 3 tables, 3 refs., 16 eqs. Russian summary p. 47. **DWB**—The author pres
a method for calculating the distance, X, from the mouth of a river at which it is necessar
make observations on salinity in order that the salinity at this point be equal to mS_m w
$m =$ a given number, for example .09 or .099, and $S_m =$ salinity in the open sea. The equa

$$x = \frac{A}{\frac{1}{m} - 1}$$

derived where

$$A = \frac{Q\sqrt{x_1}}{h\sqrt{2\pi\bar{u}_1 Ky}};$$

= mean velocity of the current at distance x, Q = discharge of river in cm^3/sec; h = depth; = coefficient of turbulent diffusion in the direction of the y axis. Examples of the determina- n of the zones of the freshening action of rivers upon salinity of water in the estuary areas of Kura, Kuban and Umba Rivers are given. Extensive data are presented in tables. *Subject adings:* **1. Salinity of sea water 2. Kura River, U.S.S.R. 3. Kuban River, U.S.S.R. 4. nba River, U.S.S.R.**—*I.L.D.*

12M–737 551.464(267)

Muromtsev, A. M., **Novye karty raspredeleniia solenosti na poverkhnosti Indiĭskogo eana.** [New charts of salinity distribution at the surface of the Indian Ocean.] *Meteorologiia idrologiia,* Leningrad, No. 11:35–37, 1958. 2 figs. **DWB, DLC**—New maps on the distribu- n of salinity at the surface of the Indian Ocean have been constructed on the basis of data ilable at the State Oceanographic Institute covering the period 1879–1957. Two maps show- the distribution of salinity during the Northern Hemisphere summer and winter are presented. e distribution of salinity south of 20°S lat. in the winter of the Southern Hemisphere is shown the first time. South of 60°S lat. the salinity increased as a result of ice formation. In May maximum salinity near Antarctica was 34.28‰. The maximum salinity in Antarctic latitudes 34.65‰, observed at a depth of 150 meters in the summer and is the lower limit for the vertical ter circulation. In further contrast to the maps of Schott the region of high salinity in the thern subtropics and the seasonal variation of this area are reduced considerably. The distribu- n of salinity north of 20°S lat. and in the Red Sea are discussed. *Subject Headings:* **1. Salinity sea water 2. Indian Ocean 3. Red Sea.**—*I.L.D.*

TEMPERATURE

12M–738 551.526.6:551.463.61

Anderson, F. P. and Stavropoulos, C. C. (*both, Cape Town, So. Africa*), **Temperature fluc- tions in the near-surface.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints abstracts of papers.* Issued Wash., D. C., AAAS, 1959. p. 529–530. German summary p. 530. **VB**—A brief description is given of the temperature structure of the upper 30 meters recorded a number of occasions at a station NNE of Cape Town. A thermistor which had been linear- d and made independent of the rate of water movement past it was used to measure temperature. cords of temperature vs. depth were obtained. Results of comparison of temperature fluctuations meter intervals with gradients per meter are given. An estimate made of the fluctuations in total t content of the column is also described. *Subject Headings:* **1. Temperature of sea water Cape Town, South Africa**—*I.S.*

12M–739 551.526.64:551.463.61

Belinskiĭ, N. A. and Glagoleva, M. G., **Metod rascheta temperatury vody v verkhnem sloe ria v tepluiu chast' goda.** [A method of calculating the temperature of surface sea water ing the warm season.] *Meteorologiia i Gidrologiia,* Moscow, No. 7:14–21, July 1960. 3 figs., ables, 14 refs., eq. **DWB, DLC** (QC851.M27). Transl. in *U. S. Joint Publications Research vice, JPRS,* 7343, Dec. 17, 1960. 13 p. 3 figs., 3 tables, 14 refs. **DWB** (M26.64 B431me)— e variation of sea temperature with depth in summer is shown by the study of three layers. e surface layer is almost isothermal, then there is a sharp drop in temperature and below the er in which this drop occurs there is a gradual decrease in temperature with depth. The main tor in determining depth of the isothermal layer is the speed of the current and not the ensity of the wind induced turbulence. In view of the dependence of the currents on the field atmospheric pressure an attempt was made to correlate the pressure field (expressed in terms a Chebyshev polynomial) with the mean temperature of the water to a fixed depth. This latter ire was shown to be a convenient indicator of the depth of the isothermal layer. No correla- was found between the existing pressure field and the temperature but a significant correlation found with the temperature and the pressure fields for the two preceding days. Thus from pressure field it is possible to estimate the temperatur variation with depth. Given, then, urface temperature, either from observations or from calculations based on heat balance rela- iships it is possible to obtain a complete estimate of the structure of the water temperature. *ject Headings:* **1. Sea surface water temperatures 2. Wind effects on sea water.**—*R.B.*

12M–740 551.214:551.463

Buljan, Miljenko (*Inst. Ocean. Fish. Split, Yugoslavia*), **The nonadiabatic increase in perature of deep Caribbean waters and the submarine volcanism.** *International Oceano-*

graphic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers. Issued Wash., D. C., AA
1959. p. 534–535. French summary p. 535. **DWB** (551.4682 I61pr)—This paper is base
hydrographic data collected during the 1933 cruises of the "Atlantis" and "Challenger." F
these data both potential temperatures and densities have been calculated. The results indi
that a non-adiabatic increase in temperature of 0.52°C exists in the deep waters of the Caribb
Evidence is also presented which shows that the "NAIT" in the eastern Caribbean is a resul
submarine volcanism similar to that observed in the Antillean Arc. *Subject Headings:* **1. T
perature of sea water 2. Submarine volcanism 3. Caribbean Sea.**—*I.S.*

12M–741 551.46

*Chew, Frank; Bein, S. J. et al., **Data report of Florida Gulf Coast Cruises.** Miami. U
(at Coral Gables, Fla.). Marine Lab., Contract Nonr 840(01), (Report), 59-1, June 1
113 p. 10 figs., almost entirely tables. **DWB** M(051) M618da—The report contains hy
graphic and chemical data collected for two years by the Florida State Board of Conserva
during 8 major cruises on the continental shelf off the Florida west coast. The first sec
analyzes over 1000 bathythermograms that had been made, giving date, hour, location and d
of station, sea surface temperature, wind and air temperature and the second section pres
the geomagnetic electrokinetograms of surface water movements, the velocities of ocean curr
ocean salinity, phosphorous, and nitrate and nitrite at various depths studied. All the data
included. *Subject Headings:* **1. Oceanographic cruises 2. Ocean current velocities
Chemistry of sea water 4. Temperature of sea water 5. Florida west coast. I. Stimson
H. G. II. Miami. Univ. (at Coral Gables, Fla). Marine Lab.**—*N.N.*

12M–742 551.526.64:551.463.61:551

Chu, Tsu-You (*Natl. Taiwan Univ. Taipei, Taiwan*), **Vertical distribution of tempera
and salinity in the waters surrounding Taiwan.** *International Oceanographic Congress,
N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 556–
French summary p. 567. **DWB** (551.46082 I61pr)—Some observations of the vertical distribu
of temperature and salinity in winter and summer in the waters surrounding Taiwan are descr
Isotherms run vertically from the surface to the bottom in January from the North Islan
Pescadores to Quemoy with temperatures of 20°C near Pescadores and 11°C near Que
Isohalines are also vertical in character with a salinity of 34.00‰ near Pescadores and 30.
near Quemoy. In August the water temperature decreased downward from the surface
salinity increased with depth. Temperature and salinity values in January and August off
east coast of Taiwan are also given. *Subject Headings:* **1. Temperature of sea water
Salinity of sea water 3. Taiwan 4. Pescadores 5. Quemoy.**—*I.S* .

12M–743 551.526.64:551.4

Cochrane, J. D., **Note on the adiabatic temperature gradient of sea water.** *National
search Council, Wash., D. C., Publication* No. 600, **1959.** p. 30–37. 2 figs., 3 tables, 8
DWB (551.4601 C748co)—A study was made on the adiabatic temperature gradient seaw
The author reexamined EKMAN's values of the adiabatic gradient so widely used in analyse
observed temperature. Valid sampling from five basins show that EKMAN's adiabatic gra
differed from the observed gradient by 5, 8, 15, 25%, respectively. Controlled laboratory m
urements rather than field measurements are considered proper criteria. The results are tabul
Subject Heading: **1. Temperature of sea water.**—*W. N.*

12M–744 551.464:551.526.6(

Fleming, Richard H. (*Univ. of Wash.*), **Notes concerning the halocline in the northeas
Pacific Ocean.** *Journal of Marine Research,* New Haven, Conn., 17:158–173, **1958.** 6 figs
refs. **DWB, DLC**—The quasi-isothermal halocline between depths of about 100 and 200 m
striking feature of the temperature-salinity characteristics in the northeastern Pacific, nort
about 40°N. An hypothesis is offered to explain the origin of this feature in terms of circula
dilution, and winter mixing. *Subject Headings:* **1. Haloclines 2. Temperature-salinity c
acteristics 3. Northeastern Pacific Ocean.**—*Author's abstract.*

12M–745 551.509.329:551.526.6(2

Forecast of water temperature in the sea south of Honshū in summer 1958. *Journ
Oceanography,* Kobe, Japan, Ser. 2, 10(1):45–48, Jan. **1959.** 6 figs., eqs. In Japanese. **DI**
For the prediction of the oceanographic conditions, the recent conditions of the water temper
in the 100 m layer and surface current at 33°N, 135°40′E and the sea surface level in the
water region off Enshunada were analyzed by using the serial correlation coefficients of devia
From these results, it may be considered that in the summer of 1959 the oceanographic condi

l be normal and the water temp. will be normal. *Subject Heading:* **1. Sea water temperature ecasts**—*K.C.*

12M–746 551.463:551.46.087

Fuglister, F. C. (*Woods Hole Oceanog. Inst.*), **Thermal structure of the deep sea.** *National search Council, Wash., D. C., Publication,* No. 473:10–18, **1957.** 3 figs. **DWB** (551.46 77pr), **DLC** (GC57.N33, 1956)—A study of the thermal structure of the deep sea. Data om the North Atlantic, Gulf of Mexico, Labrador Sea and the Norwegian Sea were analyzed. ethods of data collection for oceanographic and meteorological studies are compared. *Subject adings:* **1. Thermal structure of the oceans 2. Temperature of sea water 3. Atlantic ean.**—*E.Z.S.*

12M–747 551.526.6:551.464:551.463.6

Ganapati, P. N. and Murthy, V. S. R. (*both, Dept. of Zoology, Andhra Univ.*), **Salinity and nperature variations of the surface waters off the Visakhapatnam coast.** *Andhra Univ., altair, India, Memoirs in Oceanography,* 1:125–142, 1954. 12 figs., chart, 2 tables, 5 refs. C (GC1.A55)—Tabulated data of the horizontal distribution of salinity and temperature tained during the period Oct. 1952–March 1953, in inshore and offshore waters at lat. 17°03.0′N d 17°41.0′N and long. 83°18.2′E and 83°57.6′E, are discussed. The variations shown are closely sociated with prevailing currents and other water movements. *Subject Headings:* **1. Salinity sea water 2. Temperature of sea water 3. Visakhapatnam Coast, India.**—*W.N.*

12M–748 551.509.58:551.463.6(265.5)

Hakodate, Japan. Marine Observatory, **Forecast of water temperature in the sea east of hoku District in midsummer, 1958, by the Oceanographical Section,** Its *Bulletin,* No. 6 ontribution No. 1), Dec. **1959.** p. 37–40. of reprint (unidentified). 7 figs. **DWB**—The rface water temperature in the sea east of Tōhoku District in midsummer of 1958 is expected be normal in the Oyashio region and slightly higher than in normal years in the mixed water gion. The interrelations between the following sea conditions in early spring and the water nperature in midsummer are used for forecasting. 1. Water temperature at a fixed point in Oyashio region. 2. The Oyashio water area in the vertical section east off Shioyazaki. 3. lume transport of the Kuroshio Current east off Shioyazaki. 4. The Kuroshio water area in vertical section east off Shioyazaki and the distance between the Kuroshio current axis and coast of Shioyazaki. 5. Deviation of water temperature in the 100 m layer. *Subject Headgs:* **1. Seawater temperature forecasts 2. Western Pacific Ocean.**—*Author's abstract.*

12M–749 551.526.64:551.463.6:551.464(261.3)

Hela, Ilmo (*Inst. Marine Res., Helsinki*), **Vertical structure of the waters in the Baltic a.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* sued Wash., D. C., AAAS, **1959.** p. 691–693. German summary p. 693. **DWB**—The vertical ucture of the water which is brought about by the summer thermocline and the permanent alocline" is discussed, with reference to the water in the Baltic Sea. In the open Baltic Sea the mmer thermocline does not appear until later in the season but in the coastal waters conditions favorable for early development of the summer thermocline. A permanent "halocline" is sociated with the Baltic winter water. Relatively saline water and old saline water of the Baltic sociated with secondary halocline are brought into existence by the inflow of saline water through Great Belt and the Sound. *Subject Headings:* **1. Temperature of sea water 2. Thermones 3. Haloclines 4. Salinity of sea water 5. Baltic Sea.**—*I.S.*

12M–750 551.526.6:551.463.6(52)

Hikosaka, Shigeo and Higano, Hyoji, **Water temperature fluctuations off Muroto, Shikoku.** *cords of Oceanographic Works in Japan,* Tokyo, n.s., Spec. No. 3, issued **1959.** p. 97–101. igs., table, 6 refs.—The water temperature observations measured by 3 sets of thermistors were orded on a mili-volt meter from which auto-correlation coefficients are calculated. The results resent a fair agreement with the similarity theory of turbulence. Figures show the logarithmic resentations of Eulerian correlation coefficient function which give rise to the 4/3 power mula for the small process-time, t, i.e., $1\text{-}R(t)t^{4/3}$ as pointed out by E. Inoue in the atmospheric essure or temperature fluctuations. Then, the passage-time and the scale of the largest or edominant turbulence are estimated. *Subject Headings:* **1. Temperature of sea water 2. uroto, Shikoku, Japan.**—*K.C.*

12M–751 551.463/4:551.46.083.621.317.7

Khundzhua, G. G. (*Dept. Sea and Land Waters Physics, Moscow Univ.*), **Direct recording temperature and salinity by "bathythermosalinograph" in the Antarctic sector of the**

Pacific Ocean. *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstr*
of papers. Issued Wash., D. C., AAAS, **1959.** p. 512–514. In English and Russian. **DW**
A new apparatus which records simultaneously the electroconductivity, temperature of sea wa
and depth was used for observations at 18 stations during the third voyage of m/s *Ob* in
arctic waters of the Pacific. The instrument, called "bathythermosalinograph," has an accu
of 0.01°C for temperature and 0.01‰ for salinity. During the voyage continuous records
depth, temperature and salinity were obtained in the upper 200 m layer. The apparatus was fo
to be highly effective, not only in recording salinity values, but also in recording turbulent f
tuations. *Subject Headings:* **1. Temperature-salinity measurements 2. Bathythermosal**
graphs 3. South Pacific Ocean 4. Antarctic Ocean.—*I.S.*

12M–752 551.501:551.526.6:551.4

Konaga, Shunji (*Kobe Marine Obs.*), **Water temperature at the sea surface.** *Umi to*
(*Sea and Sky*), Tokyo, 35(2/3):44–50, **1959.** 6 figs., 2 tables, 6 refs. In Japanese; Eng
summary p. 44. **DLC**—Sea surface temperature values vary according to the type of ins
ments used in measurement. Some of the conditions causing errors were the existence
vertical temperature gradient near the surface and lowering of temperature by means of evap
tion from the thermometer. The final part of this paper shows some examples and gives rea
that prove this hypothesis. *Subject Heading:* **1. Sea surface water temperatures.**—*K.C.*

12M–753 551.463.6:551.526.6(26

*Kononkova, G. E. and Kontoboĭtseva, N. V., **Kolebaniia temperatury v poverknostnom**
moria, vyzvannye volneniem. [Temperature fluctuations in the surface stratum of the sea
duced by swells.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 12:1478–1483, **1957**
figs., 2 tables, 4 refs., 9 eqs. *Transl. into English in the corresponding number of its *Bul*
of the Academy of Sciences, USSR, Geophysics Series. **DLC**—The authors present the re
of simultaneous measurements of temperature oscillation, vertical temperature gradient, cur
velocity, height and period of waves, and wind velocity at three horizons carried out at a si
point on the surface of the Black Sea. The results of measurements made at one meter on
with different meteorological conditions were considered. Temperature oscillations with per
coinciding with the periods of waves and with phases either coinciding with those of the w
or with phases displaced 180° relative to them were noted. It is shown that these oscillation
temperature are produced by the arrival of layers of water from different horizons. Data
temperature oscillations, wind velocity, wave amplitude, temperature gradient, etc., are prese
in tables. *Subject Headings:* **1. Temperature of sea water 2. Vertical temperature grad**
3. Ocean swell effects on sea temperatures 4. Black Sea.—*I.L.D.*

12M–754 551.464:551.526.6:551

Richardson, William S. (*Woods Hole Oceanog. Inst.*), **Details of ocean structure.**
Woods Hole Oceanographic Institution, Woods Hole, Mass., **Environmental factors influen**
the performance of naval weapon systems. Woods Hole, **1959.** p. 23–28. 8 figs.) **D**
(M:623.4 W894en)—The details of vertical and horizontal structure, primarily in the re
above the main thermocline, are examined. First, the availability of data on the distributio
temperature and salinity is reviewed. Then physical processes which cause variations of
salinity and temperature are enumerated. Finally, variation with depth, horizontal and sec
variations at a particular point are discussed. The paper is extensively illustrated. *Su*
Headings: **1. Oceanic structure 2. Temperature of sea water 2. Salinity of sea water.**—

12M–755 551.463.6:551.526.6(

Robinson, Margaret K., **Sea temperature in the Marshall Islands area.** *U. S. Geolo*
Survey, Professional Paper 260-D (i.e., Ch. D of Pt. 2 of its **Bikini and nearby atolls**), 1
p. 281–291. figs. 94–99, plates 74–79 (fold. in pocket), 2 tables, 4 refs. **DGS, DWB** (M(
U582pr)—The horizontal distribution of average sea temperatures based on 6766 bathythermog
in the Marshall Islands area is presented in charts of average temperature for each month,
the surface and for the 200, 300, and 400 ft levels, together with charts of maximum, min
and range of average monthly temperatures and the annual average for the same depths. T
are two major seasonal regimes. The Marshall and Gilbert Islands chain appears to
topographical barrier across the equatorial current system giving rise to large scale eddies in
north equatorial, equatorial countercurrent, and possibly in the south equatorial current. Smo
average annual temperature curves for each 5-degree square in the area are presented fo
surface and 100, 200, 300, 350, and 450 ft. Fourteen vertical sections of temperature a
the equatorial currents, based on individual bathythermograph observations, are given. T
sections show that there are marked differences in the width of the equatorial countercurrent

the depth of the thermocline in the current boundary zones, going from east to west across the cific Ocean; and that temperatures inimical to coral reef growth in the Eastern Pacific are ınd in the euphotic zone. *Subject Headings:* **1. Temperature of sea water 2. Marshall ands 3. Gilbert Islands 4. Pacific Ocean.**—*E.Z.S.*

12M–756 551.463:551.**526.6**(261.2)
†Selitskaia, E. S., **Izmenchivost' temperatury vody na poverkhnosti otdel'nykh raĭonov vernogo Moria.** [Variability of surface water temperature in various sections of the North a.] *Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Institut, Trudy,* No. 48:104–111, **1959.** figs., 3 tables, 20 refs. Russian and English summaries p. 111. **DWB**—This article seeks to fine the basic factors determining the processes responsible for the temperature of the water of North Sea and the possibility of computing the temperature on the basis of the numerical aracteristics of these factors. Historical weather maps, records of observations and the anaical works of several authors are used in this analysis. Graphs, charts and statistical material tabular form are used to support the discussion. The conclusions reached state that among the termining factors of the temperature of the waters of the North Sea are: the water circulation tween the sea and the adjacent waters and the heat balance of the water surface. *Subject Headgs:* **1. Sea surface temperature variations 2. North Sea.**—*M.B.G.*

12M–757 551.463.6:551.**526.6**(261.3)
*Soskin, I. M. and Rozova, L. V., **Mnogoletnie kolebaniia temperatury vody Baltiĭskogo oria.** [Long-period water temperature variations in the Baltic Sea.] *Moscow. Gosudarstvennyĭ eanograficheskiĭ Institut, Trudy,* No. 37:42–52, **1959.** 5 figs., 5 tables, 16 refs.—Variations in erage monthly and annual water temperatures in the Baltic Sea, Finland and Bothnia Gulfs corded for the period 1900 to 1951 were studied in connection with relative deviations from erage temperatures at different observation points. The temperature variations are graphically alyzed and related to effects of local conditions. Attention is given to the increase of average nual water temperature in the Baltic Sea at the end of the 1920 period, which is possibly ected by parallel processes in the rising of air temperature. *Subject Headings:* **1. Temperare of sea water 2. Baltic Sea 3. Gulf of Bothnia 4. Gulf of Finland.**—*N.P.S.*

12M–758 **551.509.59**:551.463:**551.526.6**(265)
Takenouti, Yositada; Hata, Katumi and Torii, Mitsugu (*all, Hakodate Marine Obs., Hakodate, pan*), **On the forecast of surface water temperature for the frontal zone of western North cific.** (In: *UNESCO Symposium on Physical Oceanography,* Tokyo, Oct. 1955, **Proceedings,** b. **1957.** p. 96–100. 5 figs., 7 refs. French summary p. 96.) **DWB**—A discussion of the sis for oceanographic forecasts of summer water temperatures off Tohoku District. Since the rm Kuroshio water spreads toward the north in summer, the volume can be predicted in the ring by calculating the density difference between the Kuroshio and Oyashio water at the same el. *Subject Headings:* **1. Sea surface temperature forecasts 2. Kuroshio Current 3. yashio Current 4. Pacific Ocean.**—*E.Z.S.*

12M–759 **551.526.6**:551.464:551.463.6
Wooster, Warren S. and Taft, Bruce A. (*both, Scripps Inst. of Oceanog., La Jolla, Calif.*), **n the reliability of field measurements of temperature and salinity in the ocean.** *Journal Marine Research,* New Haven, Conn., 17:552–566, **1958.** 4 tables, 12 refs., eqs. **DWB, DLC** To evaluate the reliability of recent field measurements of temperature and salinity, the authors ve followed the behavior of certain pairs of reversing thermometers through many reversals and ve examined the distribution of closely spaced measurements of temperature and salinity at ermediate depths. The errors of measurement are comparable to those of the classical expedins and are small with respect to sampling and other errors in the upper layers of the ocean. e effect of measurement errors on computed values of specific volume anomaly, of geopotential omaly, and of geostrophic current speed was examined. *Subject Headings:* **1. Temperature of a water 2. Salinity of sea water 3. Oceanographic investigation techniques.**—*Author's stract.*

12M–760 551.463.6:551.**526.6**(262.5)
Zemliakov, V. M., **Temperaturnaia kharakteristika poverkhnosti vody Chernogo moria.** emperature characteristics of the waters of the Black Sea.] *Kiev, Ukraine. Nauchno-Issledotel'skiĭ Gidrometeorologicheskiĭ Institut, Trudy,* No. 8:165–174, **1957.** 4 figs., 3 tables, 2 refs. **C** (Slavic)—The author investigated the temperature characteristics of the surface of the ack Sea on the basis of 56,890 ship observations on surface water temperatures made during period 1881–1953. Maps with isolines of mean annual temperatures and mean monthly cember, May and July temperatures of the surface waters of the Black Sea, and data on the

mean annual amplitude of temperatures of water at different depths, mean monthly magnit
of fall and increase of temperature of surface waters for different depths, and data on temp
ture of surface waters in different sectors of the Black Sea are presented and discussed. *Sub
Headings:* **1. Temperature of sea water 2. Sea surface water temperatures 3. Black Se**
I.L.D.

12M–761 551.463.6:551.526.6:551

Zobell, Claude E. (*Scripps Inst. Oceanog.*), **Thermal changes accompanying the comp
sion of aqueous solutions to deep-sea conditions.** *Limnology and Oceanography,* Baltim
4(4):463–471, Oct. **1959.** 5 figs., 2 tables, 17 refs. **DLC.** Reprinted as *California. U
Scripps Institution of Oceanography. Contributions, 1959,* issued **1960.** p. 751–579. **D**
(551.46 C153co)—Apparatus is described for studying the effects of high hydrostatic pressure
the viability, reproduction, and physiological reaction rates of bacteria in aqueous soluti
Rapidly compressing such solutions to deep-sea conditions results in temperature increases rang
from 2 to 5°C. Decompressing the system to ambient pressure results in cooling to a correspo
ing degree. When the apparatus is submerged in constant temperature water bath, the ther
time constant T-63 of solutions compressed or decompressed in the steel pressure vessel is g
erally less than 3 minutes. The degree of heating or cooling is primarily a function of the cha
in hydrostatic pressure and the ambient temperature. To a lesser extent heating or cooling
influenced by the chemical composition of the solution. The degree and duration of ther
changes may be minimized by the use of small pressure vessels submerged in constant temperat
bath and by slow compression or decompression. Thermal changes were measured by bead-t
thermistors, which must be calibrated for use at each pressure and ambient temperature. *Sub
Headings:* **1. Deep sea temperatures 2. Temperature measurement techniques.**—*Auth
abstract.*

12M–762 551.464:551.579(

Spichak, M., **Sposob zablagocremennogo rascheta sredneĭ solenosti Azovskogo mo**
[Method of pre-computing the mean salinity of the Sea of Azov.] *Meteorologiia i Gidrolog*
Leningrad, 9:36, Sept. **1958.** 1 table, 2 refs. **DWB, DLC**—When the salinity of the water
the Sea of Azov reaches 12% the area of bream, perch and of other fish is decreased. The met
for calculating in advance in each year the mean salinity is based upon the relationship of wa
and salt balance. By means of data it is shown that the runoff of water from the land and
inflow of water from the Black Sea are the most important elements in the formation of salin
Since the year to year variation of mean salinity is determined by fluctuation of water bala
river runoff has a fundamental importance. As the salinity of the Sea of Azov increases the r
tive importance of river runoff will rise since the difference in the salinity of the Black Sea
the Sea of Azov diminishes and the difference between the salinity of the Sea of Azov and
river water increases. The mean salinity of the Sea of Azov can be computed from the fore
runoff and its actual salinity of the preceding year. Investigation of the relationship $S=f(F,$
where S — salinity to be computed, F — forecast runoff, S_o — mean salinity of the preceding y
gave a correlation coefficient of 0.94. Computations on the basis of the equation $S=0.86\ F-0$
$S_o+2.42$, showed that for the period 1923–1951 the computation errors had a range of 5–20
Subject Headings: **1. Salinity of sea water 2. Salinity calculations 3. Runoff effects
salinity 4. Sea of Azov.**—*I.L.D.*

12M–763 551.463.6:551.482

†Yamamoto, Hiroshi and Imai, Yoshihiko (*both, Kochi Univ.*), **Chemical investigation
rivers flowing into Urado Bay, Pt. 2.** *Umi to Sora* (Sea and Sky), Tokyo, 35(2/3):36–
1959. 4 figs., 2 tables, 9 refs. In Japanese; English summary p. 36. **DLC**—A report on
chemical investigation of the rivers flowing into Urado Bay from Nov. 1957 to Aug. 1958.
writers conducted an investigation on the variations in the chlorinity ratios of Ca^{++}, Mg^{++}
SO_4^{--} from the upper stream to this bay. The paper treats the results of vertical and horizo
observations of water temperature and chlorinity in the estuaries under normal conditions of
water in the surface and bottom water. *Subject Headings:* **1. Chemistry of sea water 2. T
perature distribution in estuaries 3. Chlorinity distribution in bays.**—*K.C.*

12M–764 551.463/4:551.52

Zubov, N. N. and Sabinin, K. D. (*both, Oceanog. Moscow Univ.*), **Contraction on mix
of sea waters.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstr
of papers.* Issued Wash., D. C., AAAS, **1959.** p. 808–810. fig. In English and Russ
DWB (551.46082 I61pr)—The phenomenon of contraction which occurs on mixing of sea wat
is explained. The term implies that due to the non-linear dependence on temperature and salin

e density of the mixture of two or more water masses differs from, and is higher than, the erage density. The difference between the density of the average temperature and salinity of the ixed waters and the average density of these waters, calculated from the formula for mixing, presents the value for contraction. *Subject Headings:* **1. Sea water mixing 2. Sea water nsity.**—*I.S.*

12M–765 551.464:551.463.6:551.526.6:536.24

Groen, P. and Postma, H. (*both, Netherlands*), **Mixing, rate of water renewal and transport heat in a deep sea basin as deduced from alkalinity and temperature data.** *International eanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAS, **1959.** p. 432–434. In English and German. **DWB** (551.46082 I61pr)—The deep sea sin considered is the non-stagnant Banda Basin in the eastern Moluccas. On the basis of ob- vations obtained during the Snellius Expedition (1929–1930), the amount of deep water entering e basin over the sill below the level of 3°C potential temperature is estimated at 6300 km^3 per ar. The methods of deducing mixing rate of water renewal and transport of heat from alkalinity d temperature data are described. *Subject Headings:* **1. Deep sea basin temperatures 2. eep sea basin alkalinity 3. Water renewal in deep sea basins 4. Banda Sea.**—*I.S.*

12M–766 551.463.6:551.511.6:551.526.64

Boguslavskiĭ, S. G., **Godovoĭ khod koeffitsienta turbulentnoĭ temperaturoprovodnosti po rtikali v more.** [Annual variation of the coefficient of the turbulent thermal diffusivity along e vertical in a sea.] *Akademiia Nauk SSSR. Morskoi Gidrofizicheskii Institut, Trudy,* 13:3–13, **58.** 10 figs., 4 tables, 5 refs., 24 eqs. **DLC, DWB** (M(055) A313tr)—The determination of e coefficient of turbulence of temperature conductivity K can be accomplished by direct and direct methods. The latter involves either differential equations characterizing the distribution heat by turbulent heat conductivity or the concrete solution of this equation. The equations Fjeldstad and Stockman for computing K are presented and on the basis of Fjeedstad's uation the author derives the formula for K on the assumption that the distribution of heat in e sea occurs only along the vertical so that K can be calculated only for areas where advection a minimum, namely

$$K_z = \frac{\int_z^h \frac{\partial\theta}{\partial t}\,dz - \frac{1-A}{c\rho}\,I_0 \int_z^h e^{-\beta z}dz}{\left(\frac{\partial\theta}{\partial z}\right)_z}.$$

ith the aid of this formula the annual variation of the coefficient of heat conductivity along the rtical in the sea is computed. The errors in the determination of the annual variation of K means of the above formula are analyzed. Formulae are developed for determining the varia- on of K with depth and with time and for calculating the annual variation of the temperature the active layer of the sea. *Subject Heading:* **1. Thermal diffusivity of the sea.**—*I.L.D.*

12M–767 551.556.8:551.526.6:551.463.6

Eber, L. E. (*U. S. Bureau of Commercial Fisheries, Stanford, Calif.*), **Effects of wind- duced advection on sea surface temperature.** *Journal of Geophysical Research,* Wash., D. C., (3):839–844, March **1961.** 4 figs., 2 refs. **DLC**—Wind-induced advection is one of the echanisms through which conditions in the surface layer of the ocean can be affected by atmos- eric fluctuations. An attempt was made to assess the relative importance of this mechanism in e northeast portion of the Pacific Ocean for two periods, fall 1957 and winter 1957–1958. Sea nditions were represented by sea surface temperatures averaged over the middle 10 days of each onth and by anomalies of these 10-day means from long-term monthly normals. Anomalous sea nperature advection was determined by using surface water displacements computed solely from onthly mean geostrophic wind anomalies. Observed sea temperature anomaly changes within ch of the two seasons were then compared with the computed advective sea temperature anoma- s. Good agreement was found for the winter period and poor agreement for the fall period. The sults for the winter period (but not for the fall period) showed a stronger correlation between mputed advective and observed sea temperature anomalies than was found earlier by Namaias r the same two cases. The attempt to take into account the initial state. It was concluded at advection may have had a dominant effect on sea surface temperature in the winter case, but is subordinate to the other processes during the fall case. *Subject Headings:* **1. Temperature sea water 2. Wind effects on sea temperature.**—*Author's abstract.*

12M–768 551.463/5

Welander, Pierre (*Stockholm Univ.*), **An advective model of the ocean thermocline.** *llus,* Stockholm, 11(3):309–318, Aug. **1959.** 5 figs., 3 refs., 45 eqs. Johns Hopkins Univ.

School of Engineering, Contract AF 19(604)-2056, Scientific Report No. 1, Dec. **1958.** 3
5 figs., 5 refs., 45 eqs. Also issued as Technical Report No. 7 under its Contract Nonr-248
and Contract Cwb-9504, Dec. **1958.** **DWB**—A theoretical study is made of the density field
the associated velocity field produced in an unlimited ocean by a prescribed density distrib
at the surface. It is assumed that all motions take place under geostrophic and hydrostatic bal
and that the density is simply advected by the motion. The computation is carried out f
spherical earth. The theory gives a depth of penetration of the surface disturbances of the
of 1000 m if one assumes a relative density variation of the order 10^{-3} and a characteristic vel
below the boundary layer of the order 1 cm. sec^{-1}. The depth of penetration is proportion
the sine of the latitude. Assuming a stable ocean with surface density increasing from
equator to the pole the theory gives a meridional distribution of density of the form observ
the real oceans. The associated zonal velocities are westerlies at high altitudes, easterlies
the equator. To permit a more precise check of the theory by laboratory experiments the c
sponding solution is derived for a rotating "dishpan." The solution is found to be of the
type as the one studied in the spherical case, but it is pointed out that fundamental differ
between the spherical and parabolic cases are likely to occur in more general solutions than
studied here. *Subject Headings:* **1. Density distribution 2. Thermoclines 3. Rotating**
pan experiments.—*Author's abstract.*

12M–769 **551.463/4:551.482.**

Chau, Y. K. (*Fisheries Res. Unit, Univ. Hong Kong*), **The influence of the outflow**
the Pearl River on the waters of the South China Sea. *International Oceanographic Cong*
1st., N. Y., 1959, Preprints of abstracts of papers. Issued Wash., D. C., AAAS, **1959.** p.
682. **DWB** (551.46082 I61pr)—The Pearl River, formed by the confluence of three tribut
pours out a massive fluvial discharge seasonally into the shelf region of the South China Sea
affects the hydrological conditions over a wide area. There are three bodies of water
undergo mixing in the shelf region: 1) fresh river water, 2) surface shelf water, and 3)
shelf water. The features of three component mixing are described and graphically illust
Temperature-chlorinity characteristics of their water bodies are described. T-cl diagrams
included and show the degrees of dilution at various stages. *Subject Headings:* **1. Tempera**
chlorinity diagrams 2. Pearl River, China 3. South China Sea.—*I.S.*

12M–770 **551.526.6:551.4**

Kang, Ho Chin (*Navy Hydro. Office, Inchon, Korea*), **The seasonal distribution of tem**
ture and salinity along the coasts of Korea. *International Oceanographic Congress, 1st, N*
1959, Preprints of abstracts of papers. Issued Wash., D. C., AAAS, **1959.** p. 682–683. Ge
summary, p. 683. **DWB**—Factors such as general water movement, precipitation, insolation
evaporation determine the seasonal distribution of temperature and salinity along the coas
Korea. Seasonal temperature and salinity variations are described and mean sea surface tem
ture and salinity values in winter and summer are given. *Subject Headings:* **1. Temperatu**
sea water 2. Salinity of sea water 3. Korean Coast .—*I.S.*

12M–771 **551.463.6:551**

Kikuchi, S., **Researches on the sea surface temperature of the East China Sea, I**
Characters on the normal conditions. *Journal of Meteorological Research,* Tokyo, 11(3)
183, March **1959.** 14 figs., 2 tables, 4 refs., eq. In Japanese; English summary p. 169. I
DLC—The author investigated the characteristics of the normal conditions of the sea s
temp. of the East China Sea during the period 1953 to 1957. The results obtained are as fol
(1) The distribution of Kuroshio or Tsushima warm current and Yellow Sea cold water
varies clearly with season. In winter season, this cold water mass projects southward near
but goes backward near 30–31°N in summer season. (2) As the annual variations in Ku
regions are mainly determined by the annual term of the harmonic component, so its
indicates a complete sine curve. (3) The annual variation in Tsushima Current and Yellow
cold water mass are also determined by the annual term, but considerably distorted by the
annual and quarterly terms. Therefore, these annual variation curves become a nonsymm
type in which the time interval for increasing curve is smaller than that for decreasing
(4) It is considered that such a discrepancy between the annual variations for these water r
is due to the differences of heat balance on these sea surfaces. *Subject Headings:* **1. Sea s**
temperature 2. Water masses 3. East China Sea.—*Author's summary.*

12M–772 **551.463:551.526.6**

LaFond, E. C. and Moore, A. T. (*both, N. S. Navy Electronics Lab., San Diego, C*
Short period variations in sea water temperatures. *Indian Journal of Meteorology and*

sics, New Delhi 11(2):163–166, April **1960.** 2 figs., 3 refs. **DWB, DLC**—A discussion of perature variability in the sea off the coasts of Southern California and Andhra, India. Sets bathythermograms were taken in both areas. The Southern California data were obtained from repeated lowerings at half-hour intervals (12 to 13 July 1950), and the Andhra coast data m 26 lowerings at one hour intervals (17 to 18 Feb. 1953). Two approaches, one in terms temperature differences and the other in terms of auto-correlation values are used to analyze data. The results are reported and graphically illustrated. *Subject Headings:* **1. Sea water nperature variations 2. Coast of southern California 3. Andhra, India.**—*I.S.*

12M–773 551.463.6:551.526.6(264,269)

Makerov, Iu. V., **Godovye i mezhgodovye izmeneniia temperaturnykh uslovii poverkh-stnykh vod Atlanticheskogo sektora Antarktiki.** [Annual and interannual changes in the nperature conditions of surface waters of the Atlantic section of the Antarctic.] *Moscow. sudarstvennyĭ Okeanograficheskiĭ Institut, Trudy,* No. 46:5–31, **1959.** 8 figs., 2 tables, 2 charts, refs. **DWB**—This study represents a comprehensive examination of the characteristics of the nual and interannual variations of the temperature conditions of the surface waters of the antic sector of the Antarctic Ocean and an analysis of the causes of the variations. It is based on observations of the whaling flotilla "Slava" from 1947–1956, upon nine expeditions of the iscovery II" during 1938–1939, and monthly maps of the distribution of ice and water tem-ature at the surface in Antarctic waters compiled by N. A. Mackintosh. The Atlantic sector s divided into three characteristic zones differing from one another by typical features of the rmal regime of the surface waters. The hydrological characteristics of these zones are pre-ted. The magnitude of the annual and non-periodic fluctuations of water temperature in the antic sector do not exceed 4–5°C and in the southern regions they are practically absent. ars with warm and cold temperature conditions during the summer occurred during the period 47–1956. There were established typical characteristics of warm and cold summers, which are ermined by the basic regime of the surface waters during years with diverse properties of the nospheric circulation. Data on the mean monthly long period surface water temperatures in ions of 5° longitude and 2° latitude and deviations of mean monthly water temperatures recorded the expeditions from mean monthly long period temperatures for squalls of 5° longitude and 2° itude ("Slava") are presented in an appendix; additional data are given in the text. *Subject adings:* **1. Temperature of sea water 2. Sea surface water temperatures 3. South Atlantic Antarctic Ocean.**—*Author's abstract and I.L.D.*

12M–774 551.464.7:543.8

†Jeffrey, Lela M. (*Jersey Production Research Co., Tulsa, Okla.*) and Hood, Donald W. (*A. M. College of Texas*), **Organic matter in sea water; an evaluation of various methods for lation.** *Journal of Marine Research,* New Haven, Conn., 17:247–271, **1958.** 2 figs., 10 tables, refs. **DWB, DLC**—Five methods of isolating organic materials from salt solutions are evalu-d for applicability in separating organic and inorganic constituents of sea water. A C^{14}-labeled ed algae culture was used as a test solution to determine the effectiveness of various methods of lating total dissolved organic material. Organic compounds, known to be involved in biological tabolism, were also added to natural sea water to determine the effectiveness of various methods isolation. Results show that electrodialysis is effective for large molecule separation; liquid-uid extraction with phenol, 2,4-lutidine, ethyl acetate, and benzyl alcohol removes substantial antities of organic material. Coprecipitation with iron is a promising method in that 95% or re of the total organic material can be removed in this manner. Removal of the remnant iron hout altering the organic material presents some problems. Carbon and other absorbents are ective in separating organic and inorganic materials, but recovery from the adsorbents is ficult. *Subject Heading:* **1. Organic matter in sea water.**—*Authors' abstract.*

12M–775 551.462:551.351.3:547.97

Laevastu, Taivo (*U. N. Food & Agri. Org., Fisheries Biology Branch, Rome*), **The occurrence pigments in marine sediments.** *Journal of Marine Research,* New Haven, Conn., 17:325–334, 58. 2 figs., table, 16 refs. **DWB, DLC**—Qualitative and quantitative studies of pigments in rine sediments, using chromatographic and spectrophotometric methods, showed the presence degradation products of chlorophylls; some of their optical properties are given. It is con-ded that pigments decompose rapidly in aerated, coarse-grained sediment whereas in deeper ers of the same sediment; under anaerobic conditions, decomposition is slow. It is suggested that decreasing amount of pigment with increasing depth of sediment can be used as a criterion for ermining the past environmental conditions of deposition. *Subject Heading:* **1. Pigments in rine sediments.**—*Author's abstract.*

12M–776 5

†Matsushida, Hiroshi and Satō, Masako (*both, Central Research Inst., Japan M Corp.*), **Organic matter of sea water, brine and bittern.** *Society of Salt Science, Japan, Bu* 13(3):110–115, June 1959. 5 figs., 5 tables, 10 refs. In Japanese; English summary p **DLC**—Soluble and insoluble organic matter of sea water (brine and bittern), were invest and the results indicate: 1) Nitrogen compounds increase with the increase in the chlorid tent in brine and bittern. Ratio of C/N was 7 to 8 in the suspended matter of sea wate it increased to about 10 to 40 in the brine and bittern, (2) $H = 49.3\ E - 37.0$, where H is s organic matter content (mg/L), and E is optical density at 463 mμ wave length, (3) the susp matter in the brine is found to be the cause of foaming. *Subject Headings:* **1. Organic m in sea water 2. Brine in sea water.**—*Authors' abstract.*

12M–777 551.464(

†Skopintsev, B. A., **Izuchenie soderzhaniia vzveshennykh veshchestv i okrashennykh o icheskikh soedinenii v Azovskom i Chernom moriakh.** [Study of the content of suspended pa and colored organic compounds in the Azov and Black Seas.) *Akademiia Nauk SSSR. M Gidrofizicheskiĭ Institut, Trudy,* 13: 113–129, **1958.** 5 figs., 5 tables, 19 refs. **DLC, DWB** (M A313tr)—During the summer and fall months of 1950–1951, the author investigated the distril of suspended matter in the Sea of Azov and in the Black Sea. Water samples brought up bathymeter were examined optically by a Pulfrich spectrophotometer. The optical determina made on filtered samples yielded information on the content of colored organic compounds (aq humus of soil origin). Standard hydrochemical determinations were made simultaneously wit optical measurements. Various papers dealing with the application of photometric measure to determine the sea water content of suspended matter and colored compounds are revi especially the experiments of K. I. Ivanov on the optical measurements made on clayey si kaolin with particles of 0.5 to 100μ in diameter and those of Erlov and Kiulenberg on Balt ribbon clay with particle diameters of 1 to 12μ. The relationship between the weight concent of suspended matter and particles of uniform diameter (C) and the extinction coefficient (k) cussed and data are presented on the parameter $a(k = a \cdot C)$ for particles of diverse dimensi different parts of the spectrum, on the variations of the ratios

$$k^{436}_{\text{susp.}} : k^{726}_{\text{nat.}}$$

as a function of particle diameter and on the direct weight determination of suspensions and cients of extinction for water samples of the Gulf of Riga and the Sea of Azov. During the su of 1950 in the Sea of Azov the coefficient of light extinction in the red part of the spectrum, giv idea of the suspended matter content of the water, had a mean value of 0.81 with variation 0.09 to 4.7. The extinction coefficient in the violet part of the spectrum in filtered water giving an idea of colored organic compounds in the water, had an average value of 0.12 with tions from 0.036 to 0.300. The calculated content of suspended matter varied from 0.9 t mg/l; the average was 9.8 mg/l. In the 0.150 m layer of the Black Sea during the summer o $k^{726}_{\text{nat.}}$ had a mean value of 0.04 with variations from 0 to 0.09; in 1951 in the open sea the mean was 0.08 with variations from 0.02 to 0.23. The computed amount of suspended matter had a value of 1.0 mg/l. Measurements of $k^{726}_{\text{nat.}}$ below 200.300 m showed considerable and irreg variations associated with the appearance of suspended sulfur in the measurement tube. *Headings:* **1. Organic matter in sea water 2. Suspended matter 3. Black Sea 4. Sea of** —*I.L.D.*

OPTICS

12M–778 551.521.3:551.463.5:5

Berger, F., **Über die Ursache des "Oberflächeneffekts" bei Lichtmessungen unter W** [The cause of the "surface effect" during underwater light measurement.] *Wetter und* Vienna, 10(11/12):164–170, **1958.** 2 figs., 3 refs. **DLC**—The so-called surface effect o effect depends upon the total reflection of brightly illuminated glass discs at the surface of This reflection causes a super-illumination which is a function of the albedo of the disc maximum value can amount up to 50%. This reflection error occurs only when the dista the disc from the surface is less than the critical distance which is defined by the radius disc and the boundary angle (refraction exponent). The course of the reflection error fr critical distance to the surface can be described satisfactorily by an approximation formu agrees well with actual measurement. The reflected light begins to become effective fr surroundings and rises in first approximation according to a function of fourth degree of distance to a maximum which is reached even when the opalescent disc is still moist. In to eliminate the reflection error its value can be determined for each filter arrangement and correction is applied when the initial value is measured with a moist opalescent disc. other hand it is suggested that the initial value should always be determined with the ai ınel shaped installation at a given place and time with a water cover that is higher than the tical distance, about 0.9 radius. A dull black internal surface is presupposed in the funnel and use of optically pure water recommended. *Subject Heading:* **1. Underwater light measure-ent techniques.**—*I.L.D.*

12M–779 551.463.54:551.464

Bliumberg, Ia. B. and Mironova, N. I., **O prozrachnosti rapy zaliva Kara-Bogaz-Gol.** ransparency of the saline water of the Gulf of Kara-Bogaz-Gol.] *Meteorologiia i Gidrologiia,* ningrad, 9:34–35, Sept. **1958.** 2 figs., 3 refs. **DWB, DLC**—Over a period of 41 years 897–1938) the transparency of the Gulf of Kara-Bogaz-Gol decreased from 1.8 m to 0.25–0.30 At the same time the total salt content increased from 16.4% to 28%. In 1947 the trans-ency of the saline water of the gulf was found to vary between 0.8–1.5 m. In 1950 the total ıcentration of saline water in the gulf increased to 30% and the transparency rose to 1.8 m. e explanation for this fluctuation in transparency is as follows: the crystallization of Glauber's t at low air temperature is accompanied by a simultaneous increase in the formation of gypsum, ich together with other mineral and organic substances forms socalled "lees." The presence the latter in salt water gives it a milky gray color which does not have an appropriate tint on color scale, and imparts to the salt water a slight transparency. In the Kara-Bogaz-Gol Gulf transparency increased with the increase in calcium content. With increasing concentration magnesium salts in natural chloride-sulfate salts the solubility of gypsum diminishes consid-ıbly. The Kara-Bogaz-Gol salt water of 1950 containing large amounts of magnesium salts ıtained practically no gypsum. Accordingly the transparency of contemporary saline water ed from the "lees" consisting primarily of gypsum, increased again but the color of the saline ter acquired a rosy tint. *Subject Headings:* **1. Salinity of sea water 2. Transparency of a water 3. Kara Bogaz Gol, Turkmen S.S.R.**—*I.L.D.*

12M–780 551.463.262

Boden, B. P. and Kampa, E. M., **Lumière, bioluminescence et migrations de la couche fusante profonde en Méditerranée Occidentale.** [Light, bioluminescence and migration of deep sonic-scattering layer in the West Mediterranean Sea.] *Vie et Milieu,* Paris, 9(1):1–10, **58.** 3 figs., 16 refs. **DLL**—A review of research carried out in the Mediterranean Sea with view to locate the deep sonic-scattering layers. Description of the instruments and method ed and statement of the results. The presence of a migratory sonic-scattering layer in the lf of Lions was established. The layer was found to be associated with the $5 \times 10^{-3}\mu$ watt/ ^{2} isolume during its twilight migration toward the surface. As the layer approached the sur-e, during its period of most rapid migration it appeared to overtake this isolume. Numerous ght flashes of bioluminescence were recorded at this time, and these may have obscured the true ationship between the depth of the scattering layer and the amount of transmitted skylight. e possibility that scattering-layer organisms possess discriminatory mechanisms which enable n to distinguish components of ambient light is discussed. The layer did not rise above a pth of about 48 m. A sharp thermocline was present at this depth and it is suggested that s may have been a barrier to further migration. *Subject Headings:* **1. Sonic scattering layer Gulf of Lions (Mediterranean Sea).**—*Authors' abstract.*

12M–781 551.463.54:551.468

Carsola, Alfred J. and Dill, Robert F. (*both, USN Elec. Lab., San Diego, Calif.*), **Trans-rency of the coastal waters off San Diego, Calif.** *International Oceanographic Congress, , N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 606– 7. French summary p. 607. **DWB** (551.46082 I61pr)—Transparency of the waters off San ego, California, was examined between 1952 and 1958. The study was made by use of a simple drophotometer and direct observations by divers. The results which are described show both atial and temporal variations in transparency. Variations in underwater visibility during differ-t seasons and at different locations are discussed. *Subject Headings:* **1. Transparency of sea ter 2. San Diego, California.**—*I.S.*

12M–782 535.4:551.463/4

Chanu, Jacques, **Extraction de la substance jaune dans les eaux côtières.** [Extraction of yellow substance in coastal waters.] *Revue d'Optique,* Paris, 38(12):569–572, Dec. **1959.** igs., 4 refs. French and English summaries. **DLC**—Research undertaken in the course of the years on sea-water transparency has shown that the strong absorption which appears towards short wave-lengths cannot, in certain cases, solely be attributed to the water itself nor to the solved ions and must be ascribed to the existence of a pigment complex usually referred to by name of "yellow substance." It has been established that the concentration of natural waters evaporation is accompanied with an increase of the absorption in the violet region of the spectrum. Using the method, recommended by J. Shapiro, the author has taken in the R waters a certain quantity of this pigment complex. A concentration ranging about 2.75 m liter was observed. This substance, which is of organic nature, does not present a conti spectrum; it shows on the contrary a maximum of secondary absorption at about 250 mμ. S *Headings:* **1. Optical properties of sea water 2. Ultra violet radiation absorption i 3. Yellow substances in coastal water 4. Roscoff, France.**—*A.V.*

12M–783 551.46.083.5:551
Duntley, S. Q. (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Penetration of light int sea.** *National Research Council, Wash., D. C., Publication,* No. 473:79–89, **1957.** 15 fi tables. **DWB** (551.46 N277pr), **DLC** (GC57.N33, 1956)—The light from the sun and th is studied as it penetrates into the sea on a sunny day. A full description is offered of the of instruments used in the measurement of radiant intensity—the hydrophotometer, the Ba layer photocell apparatus and others. *Subject Headings:* **1. Light penetration in sea 2. Optical oceanographic instruments.**—*N.N.*

12M–784 551.5:551.463.56
†Hart, T. J. (*Natl. Inst. Oceanog.*), **A possible correlation between weather condition discolored water phenomena in the eastern central basin of the Caribbean Sea.** *M Observer,* London, 29(186):191–195, Oct. **1959.** fig., 4 foot-refs., 4 refs. **DLC**—An explai is given for the similar characteristics that exist in the Trichodesmium blooms in the tropica subtropical seas and the spectacular Dinoflagellates near land. The discolored water phen in the Caribbean is attributed to the absence of phytoplankton and presence of a thermoclin cannot be broken through by winds of average force 4 (Beaufort). Several other natural are given. A list of eleven report papers covering the subject as observed by various ships the Marine Division of the Meteorological Office, during 1954 and 1955, is included. A m the positions of the discoloration phenomena is shown. *Subject Headings:* **1. Weather effec sea color 2. Sea water color 3. Caribbean Sea.**—*N.N.*

12M–785 551.521.1:551.463.5:
Holmes, Robert W. (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Solar radiation, subm daylight, and photosynthesis.** *Geological Society of America, Memoir,* No. 67, Vol. 1:10 Dec. 1957. 7 figs., 6 tables, bibliog. p. 126–128. **DLC** (QH542.N3)—A thorough summa past and present research on submarine illumination, its measurement, depth and intens penetration (extinction, transmission, etc.), and effects on marine life. Tables give valu these parameters for 12 different types of water (9 coastal and 3 ocean types) for several angles, wave lengths (300–700), and incident radiation for different months at different lat (60°N to 60°S). *Subject Headings:* **1. Submarine illumination bibliographies 2. Rad effects on submarine photosynthesis 3. Marine ecology 4. Submarine daylight.**—*M.R.*

12M–786 551.463.5:5
Ichiei, H., **(Comments on) I. Nakayama: On the influence of the river water o oceanographical condition in the western part of Wakasa Bay.** *Journal of Meteoro Research,* Tokyo, 9(2):155, March **1957.** Reply by I. Nakayama, p. 155. Original article, 8(7):422–424, **1956.** In Japanese. **DWB, DLC**—Questions by Ichiei: You have state "extinction coefficient of light indicates a more positive trend of diffused condition on land than any others." Where did this conclusion come from? And next, why has the val transparency been changed into that of extinction coefficient? Answers by Nakayama: variation of extinction coefficient of light in water is related to stronger effectiveness of land than that of chloride amount, therefore it is evidently a dependable fact that the distribution former indicates a more influential trend of diffused condition than that of the latter. The of transparency between yearly mean value and standard deviation are not always equal in r to the mathematical function. *Subject Headings:* **1. Transparency in sea water 2. W Bay, Japan.**—*K.C.*

12M–787 551.463.5:
Ivanoff, A., **Au sujet de l'utilisation d'un diagramme taux de polarisation de la lu diffusée—coefficient de diffusion pour caractériser les masses d'eau océanique.** [The u tion of a diagram · polarization rate of diffused light, diffusion coefficient so as to chara the oceanic water masses.] *Académie des Sciences, Paris, Comptes Rendus,* 246(18):2636- May 5, **1958.** 4 figs., 2 refs. **DLC**—One measures the polarization rate p of diffused li following a right angle through the sea-water samples taken at various depths, and their di coefficient β is measured in the same direction. The diagram $p - \beta$ obtained in this manner

ossible, particularly, to find local accumulations of particles in suspension, e.g., the plankton- als. A description with sketch-plan of the apparatus used is given. *Subject Headings:* 1. **ter masses 2. Underwater light polarization 3. Plankton shoals.**—*A.V.*

12M–788 551.463.5:535.51

Ivanoff, A., **Essai d'hydrologie optique entre Nice et la Corse.** [Essay on optical hydrology ween Nice and Corsica.] *Académie des Sciences, Paris, Comptes Rendus,* 246(25):3492–3496, **ne 23, 1958.** 9 figs. **DLC**—The study of the light diffused by samples of sea-water taken at stations situated between Nice and Calvi shows the coexistence, in this region, of a very pid water similar to that of the eastern Mediterranean Sea, and a much more muddy one, more logous to the waters of the Atlantic Ocean. The samples are characterized by the polarization e of the light diffused at right angles and by their diffusion modulus in the same direction. *bject Headings:* 1. **Optical hydrology 2. Light diffusion in sea water 3. Mediterranean a.**—*A.V.*

12M–789 551.463.5:535.51

Ivanoff, Alexandre (*École Physique & Chimi Ind., Paris*) and Waterman, Talbot H. (*Dept. ology, Yale Univ., New Haven*), **Factors, mainly depth and wavelength, affecting the degree underwater light polarization.** *Journal of Marine Research,* New Haven, Conn., 16(3):283– 7, **Oct. 15, 1958.** 16 figs., 2 tables, 14 refs. **DWB, DLC**—Field and laboratory comparisons visual photographic and photoelectric methods of measuring linear polarization of underwater ht demonstrate that satisfactory agreement may be obtained between their results. While labora- y data match closely, several uncontrollable factors, especially changes in cloudiness, increase variance of field measurements. Of the three, the photoelectric polarimeter lends itself best the study of degree of polarization in the horizontal plane at various depths. The present report efly describes the principle of this device and summarizes the results of a series of measurements relating principally the effects of wavelength (τ) and depth (h) down to 115 m with the gree of linear polarization in submarine illumination (p) of water masses having a wide range turbidities. Although the data so obtained are continuous through 360° in azimuth, most of analyses have been made for $\theta = 0, \pm 90$ and 180° with a few for ± 45°, where θ is azimuth asured from the sun's bearing, positive to the right, negative to the left. In general, p is ximal near the surface, diminishes rapidly in the first 10–40 m, and then decreases more slowly some equilibrium level. The maximal p, the extent of its rapid decrease, and the equilibrium ue all depend strongly on the turbidity of the water, on the cloud cover, and on the proximity l albedo of the bottom. Polarization increases rapidly with transparency in turbid and moder- ly clear waters but more slowly in extremely clear water. Thus, in quite clear water far m the bottom p may reach 60% or more near the surface, decrease rapidly at greater depths about 40 m and then level off to 30% in deep water. Under such conditions, with the solar ith angle (i) not too small, p is maximum for $\theta \pm 90°$, less for $\theta = 180°$ and least for $\theta = 0°$. th i smaller or with greater turbidity, p at $\theta = 180°$ may equal p at $\pm 90°$; under extreme ditions of this sort p may not vary with θ. The influence of τ on p is small but definite, h $p_{\min}$ occurring at blue or blue-green wavelengths; both ends of the spectrum, particularly longer wavelengths, polarize more strongly. The amplitude of the effect of τ on p (Δp) small when p is small, but $\Delta p/p$ appear relatively constant. Most of these facts are consistent h the origin of submarine linear polarization by scattering. The degree of polarization de- ases when the diffuseness of underwater light increases; that is, it decreases mainly with udiness, with depth, with turbidity, and with the τ of greatest penetration. *Subject Headings:* **Underwater light polarization 2. Photoelectric polarization.**—*Authors' abstract.*

12M–790 551.463.5:535.36

Ketchum, Bostwick H. and Shonting, David H., **Optical studies of particulate matter in sea.** Woods Hole Oceanographic Institution, Contract Nonr-2219(00), Technical Report nnumbered), **Feb. 1958.** 10 p. 19 figs., table, 7 eqs. **DWB** (551.46 W894op)—A study of ticulate matter distribution using the light-scattering photometer was made on the recent tlantis" Cruise No. 240 to the Cariaco Trench in the Caribbean Sea. This trench is a basin the coast of Venezuela which is anaerobic below the depths of about 375 m. A previous ex- lition had been made to the trench in 1955 and much physical and chemical data were obtained cerning the water properties both above and below the anaerobic interface at 350 to 400 m. A atively large amount of hydrogen sulfide was found at greater depths to the bottom. However, data were collected on the distribution of concentration of particulate matter in the waters the trench other than two Secchi disc readings. On the recent cruise, five successful lowerings the light-scattering photometer were made; two near the center of the basin, one on the tern sill, one on the western sill of the trench, and one in St. George's Harbor, Grenada, B.W.I.

This latter station gave a relative comparison of light scattering of the trench waters with t
shallow harbor water in the same latitude. Several Secchi disc readings were taken in the
to supplement scattering data. A discussion of the light-scattering data of the trench wate
its relationship to the dynamics of the water in the general area of the trench is presente
comparison is made with the light scattering and Secchi disc readings of both the trench a
continental shelf waters. In addition, a theoretical relationship of scattering intensity wi
tinction coefficient is derived along with a comparison of turbidity measurements with
oceanographic data. *Subject Headings:* **1. Light scattering in sea water 2. Oceanog
optics 3. Cariaco Trench, Caribbean Sea.**—*Authors' abstract.*

12M–791 535.243:551.463:77
Lenoble, Jacqueline, **Spectrophotomètre photoélectrique sous-marin.** [Underwater
electric spectrophotometry.] *France. Comité Central d'Océanographie et d'Etude des
Bulletin d'Information,* 9(10): 551–564, Dec. **1957.** 2 figs., table, 11 refs. **DWB**—A disc
of the complex problems encountered in underwater photoelectric spectrophotometry inv
the coefficients of real and apparent absorption as well as a means of indicating the amo
diffusion. Steps to solve the problem and the acceptable apparatus in use are discussed. *S
Headings:* **1. Optical oceanography 2. Underwater photoelectric spectrophotometry.**—

12M–792 535.4:551
Pickard, G. L. and Giovando, L. F. (*both, Univ. Br. Columbia, Canada*), **Optical turbid
British Columbia inlet waters.** *International Oceanographic Congress, 1st, N. Y., 1959
prints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 702–703. French su
p. 703. **DWB**—Measurements of optical turbidity made with a commercial light scattering
photometer, for the purpose of determining distribution and character of particulate matt
reported. Particle size was also determined. Values for turbidity and particle size in Bute
with a large summer runoff, and for turbidity in Jervis with a smaller runoff are presen
tabular form. *Subject Headings:* **1. Optical properties of sea water 2. British Columbia**

12M–793 551.521.3:551.463.5:
Preisendorfer, Rudolph W. (*Scripps Inst., U. Calif.*), **Theoretical proof of the existe
characteristic diffuse light in natural waters.** *Journal of Marine Research,* New Haven,
18(1):1–9, June 30, **1959.** fig., 8 refs., 20 eqs. **DWB, DLC**—This paper develops a
matical model for the radiance distribution of light penetrating a homogeneous hydrosol
basis of the general theory of radiative transfer. It is proved that the radiance distri
approaches an asymptotic pattern at great depths. This is in accord with previous field me
ments of the directional patterns in underwater light and with L. V. WHITNEY's conjectur
there is at some depth in natural waters a characteristic diffuse light symmetrically distr
around the vertical. The angular form of this equilibrium light pattern is derived in terms
mathematical model presented. *Subject Headings:* **1. Radiative transfer theories 2. O
properties of sea water 3. Light diffusion in sea water.**—*Author's abstract.*

12M–794 551.46.083.5:535:551.521.16:551
Sasaki, Tadayoshi; Watanabe, Seiichi; Oshiba Gohachiro et al., **Measurements of a
distribution of submarine daylight by means of a new instrument.** *Oceanographical S
of Japan, Tokyo, Journal,* 14(2):57–52, June **1958.** 11 figs., 4 refs. **DWB**—The author
studied methods of measuring angular distribution of submarine daylight and constructed
instrument. The instrument is suspended in seawater and the measurement can be carri
by remote control from on board a ship. From results of the experiments at sea the a
have found, that this instrument is entirely suitable for research. The experiments at s
measuring angular distribution of daylight in the horizontal plane at each voluntary depth
80 m have further brought about a lot of interesting results. *Subject Headings:* **1. Oc
graphic instruments 2. Light measurement instruments.**—*Authors' abstract.*

12M–795 551.463.5:535.51 551.46.08:
Sasaki, Tadayoshi (*Tokyo Univ.*); Okami, Noboru; Watanabe, Selichi and Ōshiba, Goh
(*all, Phys. & Chem. Res. Inst. Tokyo*), **Measurements of submarine light polarization.** *R
of Oceanographic Works in Japan,* Tokyo, n.s. 5(1):91–97, Feb. **1959.** 8 figs. (inc. phot
refs., eq. **DWB**—Polarized light on horizontal lines of sight in the sea was measured
photoelectric polarimeter placed in the underwater chamber of "Kuroshio" and an interf
analyzer attached to the underwater camera. It is deduced that with increased depth the st
polarization tends to approach the same value in all directions. *Subject Headings:* **1. Unde
light polarization 2. Underwater cameras.**—*E.Z.S.*

12M–796 551.463.57:535.37

Snodgrass, James M. (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Observations of bio- inescent flashes in and near the deep scattering layer.** *National Research Council, Wash., C., Publication,* No. 473:147–148, **1957.** 3 figs. **DWB** (561.46 N277pr), **DLC** (GC57.N33, 5)—This is a short review of talks given by Duntley and Hersey on the variation of light nsity and irradiance with depth, and of how the graphical presentation of it can be super- osed on bathymeter traces. *Subject Heading:* **1. Bioluminescence.**—*N.N.*

12M–797 551.463.5:551.46.083.5:535.4

Tyler, John E. (*Univ. California*), **Measurement of light in the sea.** *Pacific Science Con- s, 9th, Bangkok, 1957, Proceedings,* Vol. 16, pub. **1958.** p. 237–238. **DWB** (M(06) P117p) n explanation of methods of measurement of light in the sea. Radiometric concepts are ained. It is pointed out that by proper use of underwater photometers with flat plate and rical collector, it is possible to obtain values for four of the optical constants which describe interaction of natural light with sea water. Four additional constants can be measured with ydrophotometer. Three possible choices of color filters are mentioned. The measurements ribed have been recommended primarily because of their usefulness in predicting light levels he sea, in predicting the generation and degeneration of contrast in the sea, in separating the ct of absorption from that of scattering, and in making computations regarding the submarine t field. *Subject Headings:* **1. Optics of sea water 2. Optical instruments 3. Hydro- tometers 4. Underwater photometers 5. Color filters.**—*E.Z.S.*

12M–798 551.46.083.5:546.212:535.65

Tyler, John E. (*Visibility Lab., Scripps Inst. Oceanog.*), **Natural water as a monochromator.** *nology and Oceanography,* Baltimore, 4(1): 102–105, Jan. **1959.** 3 figs., 3 refs., 2 eqs. **C.** Reprinted as *California. Univ. Scripps Institution of Oceanography, Contributions, 1959,* ed **1960.** p. 52–55. **DWB** (551.46 C153co)—Many of the spectral data on the optical con- ts of natural water are suspect because of errors introduced by light "leakage" outside the ed band of the filter used. The magnitude of this error is computed for a specified water ple under specified natural lighting when measured with a specified detector and filter. The rs are large even for measurements at shallow depths. Methods for avoiding this error are gested. *Subject Heading:* **1. Optical properties of sea water**—*Author's abstract.*

12M–799 551.46.083.5:551.463.56

Zaklinskiĭ, A. B., **Izmeneniia v konstruktsii belogo diska dlia izmereniia tsveta i prozrach- ti morskoi vody.** [Modifications in the construction of the white disc for measuring the r and transparency of sea water.] *Meteorologiia i Gidrologiia,* Moscow, No. 9:40, Sept. **1959.** **DWB, DLC**—A 4 mm cut was made in the disk along the radius from the center to the e. The metallic tube was replaced by a messenger weight from a marine rotator and was ened by screws with the iron disk weight; since the cut coincides with the cut of the weight. disk was strapped to a metallic cable about 10 m above the terminal weight where there was ark preventing the slipping of the bathometer to the terminal weight. The advantages of e modifications are as follows, viz: (1) it is unnecessary to prepare and mark special plumb s; (2) the length of the traveling cable is determined by indications of the winch; and (3) disk can be released when the vessel is drifting in a strong current. *Subject Headings:* **nsparency of sea water 2. Color of sea water.**—*I.L.D.*

ACOUSTICS

See also: **Chem. of the sea** (Picotti), 12M–674.

12M–800 621.396.9:551.463.21

Crombie, D. D., **Doppler spectrum of sea echo at 13.56 Mc./s.** *Nature,* London, 175 59):681–682, April 16, **1955.** 2 figs., 2 refs. **DWB**—The Doppler frequency shift of radio es reflected from the sea shows surprising constancy and a small range of frequencies. This ttributed to the waves acting as a diffraction grating. It is suggested that by the use of ger waves sea waves of great lengths could be observed. *Subject Heading:* **1. Radar echoes n sea.**—*C.E.P.B.*

12M–801 551.463.21

Daniels, Fred B., **Acoustical energy generated by the ocean waves.** *Acoustical Society of erica, Journal,* 24(1):83, Jan., **1952.** fig., 4 refs. **DLC**—An estimate of the order of mag- ide of the acoustical energy generated by ocean waves indicates that this energy is large ugh to cause an appreciable heating effect at ionospheric levels, where most of it is absorbed.

Using data obtained from surface measurements of the pressure amplitude, it is found that re density changes of the order of 1% occur at ionospheric levels, and the suggestion is mad the "twinkling" of cosmic sources of radio waves is a result of this phenomenon. *Subject ings:* **1. Marine meteorology 2. Acoustical energy of waves.**—*Author's abstract.*

12M–802 551.463.22

Del Grosso, V. A., **Speed of sound in pure water and sea water.** *National Res Council, Wash., D. C., Publication* No. 600, **1959.** p. 185–197. fig., 22 refs., eqs. **DWB** 4601 C748co)—The discussion largely treats Kuwahara's tables but the contributions of E and other workers are considered. It is shown that Kuwahara's tables are in error, Amagat and Ekman's tables can stand improvement too. It is noted that the equation fo speed of sound referred to in the NLR Report 4002 is found satisfactory and is in agre with measurements conducted by P. P. Ganson, who recommends the equation for use in oc graphic work in the U.S.S.R. *Subject Headings:* **1. Sound velocity in sea water 2. S velocity in pure water.**—*W.N.*

12M–803 551.463.21:621

Free, Louis J. (*U. S. Navy Underwater Sound Lab., Fort Trumbull, New London, C* **Background noise measurements at the Sea Horizon.** *Optical Society of America, Jo* 49(10):1007:1011, Oct. **1959.** 9 figs., 4 refs. **DLC**—The design of passive infrared det systems requires a knowledge of the sea-horizon background noise. The horizontal wave-n distribution of noise from the sky immediately above and the sea immediately below the h was measured during 1956 and 1957. The measurements, which are discussed, included the of wave numbers from 7.1 to 91 cycles/rad. The results are graphed in terms of the one-d sional angular Wiener spectrum of the background noise as a function of the horizontal number and show that both the sky and sea noise spectra are inversely proportional to th power of the wave number in the region from 14 to 91 cycles/rad. A brief discussion o analyzing equipment is also included. *Subject Headings:* **1. Noise measurements a 2. Sea noise spectra.**—*Author's abstract.*

12M–804 551.463.284

Hays, Earl (*Woods Hole Oceanog. Inst.*), **Underwater sounds.** (In: Woods Hole O graphic Institution, Woods Hole, Mass., **Environmental factors influencing the performan naval weapon systems.** Woods Hole, **1959.** p. 85–95. 7 figs., 8 refs.) **DWB** (M W894en)—This paper discusses shallow water sound transmission. The situations that c explained by ray theory and those that require the wave solution are discussed separately. V aspects of the reverberation in the ocean are considered. The boundaries of the water v under observation and inhomogeneities in the water are the sources of reverberation. F the ambient noise in the water is described. This is defined as the sounds that are present than those of the desired target. The paper is extensively illustrated. *Subject Headin* **Shallow water sound transmission.**—*I.S.*

12M–805 551.462:531.

Hill, M. N., **Notes on the bathymetric chart of the N.E. Atlantic.** *Deep-Sea Res* London, 3(3):229–231, April **1956.** fold. chart, 6 refs. **DLC**—During geophysical and o graphic cruises undertaken from Britain during the past ten years it has been possible to a large quantity of sounding information in the area of the N.E. Atlantic neighboring Britai France. This information combined with the previously available was sufficient to allo attempt at detailed contouring of a considerable proportion of the area. The result o attempt is shown in the chart accompanying this paper, which is presented as much wit intention of indicating what is not known of the area as what is. It is hoped thereby that sounding lines will be arranged to pass through those areas in which the information is inade *Subject Headings:* **1. Oceanographic soundings 2. Bathymetry 3. Northeast Atlan** *From author's introduction.*

12M–806 534.22:551.

Lee, Owen S. (*USN Elec. Lab., San Diego, Calif.*), **The effect of an internal wave on u water sound.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstra papers.* Issued Wash., D. C., AAAS, **1959.** p. 560–563. 2 figs. In English and Ge **DWB**—A theoretical two-dimensional study of underwater sound in the presence of an in wave is briefly reported. The ocean considered in this study is three-layered. Althoug internal wave and the sound velocity structure are idealized, both are representative of su conditions of the Southern California Coast. The internal wave is found to cause hori ges in the sound intensity of 22 decibels over distances of less than one internal wave length 00 to 700 ft in range. *Subject Headings:* **1. Sound velocity in sea water 2. Internal waves outhern California Coast.**—*I.S.*

12M–807 551.463.21

Machlup, Stefan and Hersey, J. B., **Analysis of sound-scattering observations from non- orm distributions of scatterers in the ocean.** *Deep-Sea Research,* London, 3(1):22, Oct. . 13 figs., table, 7 refs., eqs. **DLC**—A method is described for computing the vertical dis- ition of volume-scattering coefficient from a scattering experiment in which an explosion is as the sound source, and a hydrophone having specified directional properties feeds a recorder ugh a band-pass filter. Formulae for the echoes from several model distributions of scatterers derived as functions of time and frequency. The information about marine scatterers obtain- from the scattering spectrum is discussed. *Subject Heading:* **1. Sound scattering in sea er.**—*Author's abstract.*

12M–808 551.463.21:534.2

Martin, A. V. J. (*Carnegie Inst. of Tech., Pittsburgh*), **Sur la propagation du son dans de mer.** [Propagation of sound in sea water.] *Annales de Géophysique,* Paris, 13(4):307– Oct./Dec. **1957.** 5 figs., 30 refs. **DLC**—Measurements were made comparing the speed of d in pure water and in sea water at pressures up to 1000 atmospheres. The equipment used escribed and a schematic plan illustrates the method of measurement. Curves obtained for the in pure and sea water are similar but the difference in speed shown in tables indicate the city is greater in sea water. *Subject Headings:* **1. Sound propagation in sea water 2. nd propagation in pure water.**—*E.Z.S.*

12M–809 621.396.9:551.463.543

Robb, E. M., **Some practical experience of sea clutter.** *Institute of Navigation, London, nal,* 7(4):362–364, Oct. **1954.** table. **DWB**—Describes, with table, relations between wind e, wave conditions and target detectability. *Subject Headings:* **1. Radar echoes from sea ea clutter.**—*C.E.P.B.*

12M–810 534.22:551.462:551.463.21

Shumway, George (*USN Elec. Lab., San Diego, Calif.*), **Acoustic properties of sea floor ments.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of rs.* Issued Wash., D. C., AAAS, **1959.** p. 663–664. Russian summary p. 664. **DWB**— ılts of the acoustic measurements made by a resonance technique on 111 unconsolidated marine ment samples, ranging from shallow water sands to deep-sea clays are described, measurements made of compressional sound speed and absorption. Since the samples included most of the mon marine sediment types these measurements provide the general range of values to be cted for sea floor sediments. *Subject Heading:* **1. Acoustic properties of marine sediments.** *S.*

12M–811 551.510.62:551.463.24:621.397.968

Sofaer, E. (*British Broadcasting System*), **Phase-coherent back-scatter of radio waves at surface of the sea.** *Institution of Electrical Engineers, London, Proceedings, Pt. B,* 105(22): -394, July **1958.** 15 figs., table, 6 refs. Shorter version with title **Sea-scatter interference television reception** in *Institution of Electrical Engineers, London, Journal,* 4(43):350–353, **1958.** 6 figs. **DLC**—The British Broadcasting Corporation inaugurated in Dec. 1954 a ision service in Devon. The transmitter site was a peak on Dartmoor, 1675 ft above sea . Complaints came from coastal areas around Plymouth that rhythmic variations in am- de were affecting the transmission. A description of the investigations which followed is n. The phenomenon was examined theoretically. It was shown that the variations were ed by phase-coherent back-scatter from the sea; this depends on the configuration of the ace of the sea. *Subject Headings:* **1. Radio wave scattering 2. Radio wave distortion by n waves.**—*N.N.*

12M–812 551.501.81:551.463.53

Staley, Raymond C., **Some problems in modelling water waves for the study of back- tering of microwave radio energy.** *Deutsche Hydrographische Zeitschrift,* Hamburg, 11(6): -258, **1958.** 12 refs., 11 eqs. English, German and French summary p. 255. **DWB**—Exist- information on back-scattering of centimeter radio energy by ocean waves is examined with thought that back-scattering might be modeled using small water waves and millimeter radio es. The author concludes that such modeling will be unsuccessful because the scattering of millimeter radio waves will be by capillary water waves rather than gravity waves. *Subject* *ings:* **1. Radar echoes from sea 2. Ocean wave models 3. Model experiments.**—*A* *summary.*

12M–813 534:551.

Urick, R. J. (*Ordnance Research Lab., Penna State Univ.*), **The processes of sound sc ing at the ocean surface and bottom.** *Journal of Marine Research,* New Haven, Conn., 1 134–148, Nov. **1956.** 10 figs., 9 refs. **DWB, DLC**—In order to have a firm basis for th diction of reverberation or back-scattering of sound in the sea, field measurements leading to for a back-scattering coefficient of the sea surface and bottom have been made. Variation c coefficient with angle of incidence of the sound beam provides some interesting clues as back-scattering processes which operate. It is suggested that three different processes of s ing from the sea surface are dominant in different ranges of angle between grazing and n incidence. At angles near normal incidence, sound appears to be returned toward the sou mirror-like reflection from wave facets. At angles near grazing incidence, a scattering below the surface is indicated as the important scatterer at moderate sea states. At intern angles, rough-surface scattering by small surface irregularities is suggested as the dominant of scattering. For bottom-scattering, the latter process appears to be the important one angles of incidence for the harder bottom types. *Subject Headings:* **1. Sound scatteri sea surfaces 2. Sound scattering at sea bottom 3. Acoustics.**—*Author's abstract.*

12M–814 534:551.4

Weston, D. E., **Observations on a scattering layer at the thermocline.** *Deep-Sea Re* London, 5(1):44–50, May **1958.** 4 figs., 13 refs., 6 eqs. **DWB**—A strong and extensive scattering layer has been observed in the North Sea, at the depth of the summer thermocline behavior of the scatterers in daylight and at night is discussed. Calculations show that th is not directly due to the physical discontinuity, confirming the usual biological theory origin. There is a probable identification of traces due to both plankton animals and fish scattering layer also acts as a marker for the thermocline, making possible some continuous urements of thermocline depth. *Subject Headings:* **1. Sound scattering layer in sea 2. Thermoclines 3. North Sea.**—*Author's abstract.*

12M–815 534.22:551.463.22:551.46.083:5

Wilson, Wayne, **Velocity of sound in sea water: pressure effects.** *National Re Council, Wash., D. C., Publication,* No. 600, **1959.** p. 177–184. 4 figs., 11 refs. (551.4601 C748co)—The methods used in measuring velocity of sound in sea water at the are described. Earlier work is reviewed and KUWAHARA's computed data are plotted fo parison with the experimental data by N.O.L. An instrument is under development whic permit the same experimentor to take velocity and specific volume measurements under con conditions. The instrument known as the ultrasonic densiometer, to be ready for use J 1959. *Subject Headings:* **1. Sound velocity in sea water 2. Ultrasonic densiometers.**—

12M–816 551.596.1:534.2:550.34:5

Zverev, S. M., **Ispol'zovanie zapiseĭ zvuka dlia opredeleniia rasstoianiĭ pri rabota glubinnomu seĭsmicheskomu zondirovaniiu na more.** [Use of sound records for deter distances in work with deep seismic sounding at sea.] *Akademiia Nauk SSSR, Izvestii Geofiz.,* No. 4:560–569, April **1959.** 10 figs. (2 fold.), 11 refs., 3 eqs. Russian summary, Transl. into English in the corresponding number of its *Bulletin of the Academy of Sc USSR, Geophysics Series.* **DLC**—The determination of distance from the time of arriva sound wave from an explosion in deep seismic sounding of the sea is examined in order to a method for determining the distance from explosions to the point of observation with a ma error of 1%. Calculation of the kinematic picture of the initial part of a sound record ocean taking into account variations of velocity with depth as obtained from hydrologic dat cated that the groups of the variation of the velocity of the first arrival of sound along the represent a complex curve with several maxima near the point of issue of the rays with to the bottom. A comparison of calculated data involving the use of the initial arrivals of and a constant velocity with experimental data yields an error up to 2.2%. Two metho determining more accurately the distances from the record of arrival of sound are presented first is based on the use of the time of the very first arrivals of sound and a variable v calculated according to the law of variation of sound in water with depth for a known relief. The accuracy of this method was not less than 0.4%. The second method is based time of the beginning of continued sound record and a velocity constant for the entire relief accuracy of this method was not less than 0.7%. Examples of seismograms upon which the d determined with these methods are presented. The differences between distances determined by ese methods did not exceed 0.4%, the deviations from distances determined by earlier methods was eater than 1.2%. *Subject Headings:* **1. Seismic sounding at sea 2. Sound transmission in a water.**—*I.L.D.*

12M–817 537.723:551.463.7

Hamon, B. V. (*Div. Fisheries and Oceanography, CSIRO. Cronulla, New South Wales, stralia*), **The effect of pressure on the electrical conductivity of seawater.** *Journal of rine Research,* New Haven, Conn., 16(2):83–89, Aug. **1958.** 2 figs., 3 tables, 5 refs. **DWB, LC**—Values of the pressure coefficient of electrical conductivity of sea-water (chlorinity .7‰) at different temperatures are presented. The pressure coefficients vary from 1.50 × 10^{-5} cibar^{-1} at 0.5°C to 0.82 × 10^{-5} decibar^{-1} at 19.5°C. The accuracy is estimated to be ± 5%. e results have been confirmed by tests at sea. *Subject Heading:* **1. Sea water conductivity.**—*thor's abstract.*

SEA ICE

See also: **Ice and navigation conditions** (Lauber), 12M–83; **Drift ice, Okhotsk Sea** (Sawada), 12M–91; **Marine hydromet. forecasting** (Belinskiĭ), 12M–502; **Ice in Barents Sea area** (Elliott), 12M–505; **Relation between geostrophic and surface wind** (Romanov), 12M–540; **Chlorinity of sea water** (Suzuki, Ishida), 12M–732; **Oceanog. obs., Okhotsk Sea** (Hakodate), 12M–983; **Oceanog. obs., Okhotsk Sea,** 12M–984; **Sea ice on coast of Hokkaido** (Kawakami), 12M–1003; **Arctic drifting station Charlie** (Cromie), 12M–1048; **Kara Sea** (Judge), 12M–1052; **Oceanog. obs.** (Worthington), 12M–1056; **Japanese Antarctic Research Expedition** (Kusunoki), 12M–1058.

12M–818 551.467 551.322:539.41:551.326.7

Funai, A. I. (*U. S. Naval Civil Engin. Lab., Port Hueneme, Calif.*), **Some physical proper- s of artificial sea ice.** *U. S. Air Force. Cambridge Research Center, GRD Research Notes,* . 29, Dec. **1959.** p. 129–135. 3 figs., 3 tables. **DWB**—Test results indicate the strength of ificial sea ice is about 50% that of natural sea ice in compression and about 80% in tension. use for the lower strength is believed to be the higher brine content, of the artificial ice for y specified temperature. Porosity may also have a detrimental effect on strength but its mag- ude is unknown. *Subject Heading:* **1. Sea ice properties.**—*E.Z.S.*

12M–819 551.467:551.326.7(261.3)

Hela, Ilmo (*Inst. of Marine Res., Helsinki, Finland*), **The Baltic Sea as an object of ice dies.** *National Research Council, Wash., D. C., Publication* No. 598:29–35, Dec. **1958.** 4 figs., eqs. **DLC, DWB** (551.311 A675pr)—It would be a mistake to assume that the success of the ltic ice investigators could be transferred to the Arctic Sea without careful adjustments. There ists hydrographical and other differences between the Baltic and the Arctic, especially when nsidering sea ice prediction techniques. The special character of the Baltic Sea is explained. ice, inside the Baltic Sea, a number of different types of geomorphological and hydrographic gions can be seen three different regions are taken into account: the Archipelago areas inside Baltic entrances, the open sea inside the Baltic entrances, and the sea area outside the Baltic trances. The hydrography of the Baltic Sea in relation to the ice conditions, movements of , and the types of ice is described. Two diagrams show the conditions under which ice is rmed on the sea surface and the genetic division of the types of Baltic Sea ice. *Subject Head- ys:* **1. Sea ice formation 2. Sea ice forecasting 3. Baltic Sea.**—*I.S.*

12M–820 551.467:551.326.6/7(99)

Korotkevich, E. S., **Ledovyĭ rezhim moria Deĭvisa i sosednikh raĭonov okeana.** [Ice nditions of the Davis Sea and adjacent areas of the ocean.] *Sovetskaia Antarkticheskaia speditsiia, 1955–,* [*Materialy*], Vol. 2, issued Leningrad, **1959.** p. 93–103. 5 figs., foot-ref. **WB** (M82/99 K81pe)—Broad description of the ice conditions in the Davis Sea and its vicinity based on the author's observations, aero-surveys and the data obtained by other members of the pedition. Practically along the entire sea line the shore is formed by the precipice of a glacier. e shore line varies continuously due to the breaking off of the overhanging or floating glacier's ss, the latter forming icebergs of different shapes. The sea ice forms a circle around the tarctic continent during the entire year. In the region of the Davis Sea the width of this ice t during the winter reaches about 1000 km and during the summer as much as 50 to 100 km. e position of the northern edge of the drifting ice varies considerably, as is illustrated on the

map, and the distribution of the ice, surveyed by the systematic aeroplane flights is show
another map. The formation of the shore-ice continues during the whole year, even during
summer. The processes of the formation, separation from the shore and destruction are desc
in detail giving location and time of year. Special attention is given to the various form
icebergs. The icebergs, being in large part under water, are moved predominantly by the
currents and in lesser degree by the wind. *Subject Headings:* **1. Sea ice conditions 2. D**
Sea, Antarctic region.—*N.P.S.*

12M–821 551.326.7:55

Kusonoki, Kou, **Recent advances in the study of sea ice.** *Low Temperature Science,*
A, Physical Sciences, Sapporo, Japan, 14:155–184, **1955.** 5 figs., 3 maps, 4 tables, 113 refs.,
In Japanese. Also his: **Brief review of studies on sea ice in Japan.** *Ibid.,* 12:145–159,
95 refs. In Japanese. **DWB, DLC**—In first article a study of international nomenclature
in Europe, America, and Russia is presented in tables. Differences in functional termino
methods of reporting and the history of observatories are indicated. A chart shows ice obs
tions comparing the U. S. and Russian system of nomenclature. A general discussion on se
conditions in winter in many parts of the world, Baltic Sea, Arctic, N. Hemisphere and vic
of Japanese Sea and bibliographical notes are included. Fundamental equations on the n
of sea ice, its formation and decay, physical and chemical peculiarities, and dynamic-elect
characteristics are considered. Brief account is given of forecasting by using equations an
geographical divisions. Studies of ice islands are reported. *Subject Headings:* **1. Sea ice fo**
tion 2. Ice islands 3. Sea ice bibliographies.—*K.C.*

12M–822 551.467:551.509.5:551.

*Lee, Owen S. and Simpson, Lloyd S., **Practical method of predicting sea ice forma**
and growth. *U. S. Hydrographic Office, Technical Report* No. 4, Sept. **1954.** 27 p. 2 figs
tables, 4 refs., eqs. **DWB**—A technique for predicting ice formation and growth is prese
Using the ice potential calculations and heat budget equations of various authors, new form
are derived for computing ice growth in terms of known or predicted oceanographic and
orological data. The technique is applied to forecasting ice conditions in Baffin Bay-Davis S
area for 1952–53. *Subject Headings:* **1. Sea ice forecasting 2. Sea ice formation 3. B**
Bay-Davis Strait.—*Authors' abstract.*

12M–823 551.526.6:551.464:551.

Tabata, Tadashi, **On the formation and growth of sea ice in the southern part o**
Okhotsk Sea. *Low Temperature Science, Ser. A, Physical Sciences,* Sapporo, Japan, No
175–186, **1960.** 5 figs., table, 11 refs., 11 eqs. In Japanese; English summary p. 185
DWB, DLC—The depth of thermohaline mixing which occurs before and during sea ice f
tion and also ice potential were calculated for the southern part of the Okhotsk Sea. The
of oceanographic observation carried out at the beginning of September "Sōyō-maru," 1941
used as the basis of computation. In this season, thermal energy stored in sea water is co
ously removed to the air. The amount of evaporation from the sea surface was assumed as
to that of precipitation, in view of the work by Jacobs. Heat loss due to evaporation and
zontal movement of sea water were neglected. As the method of computing ice potential,
proposed by Defant was adopted. Before sea ice forms, mixing is accomplished merely by
perature change of sea water. If a temperature below the freezing point is required for f
mixing, sea ice forms and the salinity of remaining water is increased. Figures show the v
distribution of temperature and salinity observed by "Sōyō-maru" and also that computed.
these figures, the process of mixing is easily recognized and it is known that the forecast dis
tion are in fairly good agreement to that observed by "Toyama-maru" at the beginning of
1942. The depth of mixing layer accomplished before ice formed is shown in a figure an
amount of heat loss required for mixing (i.e., ice potential) is seen in another figure. Usin
date of first ice formation obtained theoretically by Fukutomi, the author calculated the
daily loss of heat between September and December as is seen in a figure for the so
Okhotsk Sea, 0.3 kg·cal/cm^2 day is obtained. The approximate thickness of ice was calcula
stations 7 and 15 of "Sōyō-maru" and was estimated as 95 and 110 cm, respectively. I
calculation, as the depth of mixing layer that actually observed by "Toyama-maru" after t
has melted was adopted and the results of ice potential computation shown in a table was
used. *Subject Headings:* **1. Sea ice formation 2. Southern Okhotsk Sea.**—*Author's ab*

12M–824 551.467:551.526.6:551.326.7

Uralov, N. S., **O vliianii Nordkapskogo techeniia na ledovitost' Barentseva moria.**
influence of the North Cape current on ice conditions in the Barents Sea.] *Moscow. Gosu*

ınyĭ Okeanograficheskiĭ Institut, Trudy, No. 37:14–33, **1959.** 7 figs., 7 tables, 19 refs., 2 eqs. ssian summary p. 33. **DWB**—The problems of hydrology of the Barents Sea, especially those ated to seasonal and multi-years variations of the oceanographic characteristics, are discussed the basis of the tabulated data on average temperatures and average velocities of movements the North Cape current during periods of 1927 to 1953. The analysis of these data suggests ations between the heat content in the North Cape current and general ice conditions in the rents Sea and also suggests relations between actual ice conditions computed on the basis of the and water temperatures. *Subject Headings:* **1. North Cape Current 2. Ice conditions in rents Sea 3. Barents Sea.**—*N.P.S.*

12M–825 551.501.9:551.326.7:551.467

Washington (State). Univ. Dept. of Meteorology and Oceanography, **Drifting Station arley.** Contract Nonr-477(24) (Project Husky), Semi-Annual Report, Dec. 1, **1959.** fig., 7 les, eqs. **DWB** (M(051) W31dr)—The investigations carried out as part of Project Husky Drifting Station Charley from June 1 to October 30, 1959, and at Arctic Research Laboratory, int Barrow, Alaska from June 1 to December 1, 1959 are described. At Station Charley intigations were made in the fields of crystal fabrics, micrometeorology, and oceanography. Preinary report on sea ice crystal fabric studies and a report on the geological sampling on Station arley are separately presented as appendices. At Point Barrow apart from the micrometeoroical investigations a study was made of conductivity-reflectivity of various physical materials h properties deposited on the snow surface. A second study was made of isolation vs. insula-1. The details of reflectivity-conductivity investigation are given in the appendix. *Subject adings:* **1. Sea ice crystal fabric 2. Project Husky 3. Drift Station Charley 4. Point Bar-v, Alaska 5. Arctic Ocean.**—*I.S.*

12M–826 551.467:551.511:551.542:551.326.7(268)

Browne, Irene M. (*GRD, AF Camb. Res. Center, Mass.*), **Ice drift in the Arctic Ocean.** *ıerican Geophysical Union, Transactions*, 40(2):195–200, June **1959.** 3 figs. **DWB, DLC**—is report is based primarily on a preliminary survey of drift information obtained during the t 12 months of the IGY. The general character of ice drift is described and some of the ctic Ocean drift patterns are shown. In general, the ice drift follows closely the sea-level ıospheric pressure systems, the clockwise orbit of ice movement of the North American side of Arctic Ocean corresponds to the major motion of the surface currents, and the rate of trans-t of surface waters and the rate of the observed ice drift in this region are of the same order magnitude. Wind drift of the ice is discussed and the relationship with atmospheric pressure tems indicated. Correlations are made between drift speed and Coriolis effect. Arctic ocean rents are discussed. Analysis of data collected from Station Alpha shows that movement in upper 16 m of the water corresponded to that of the ice in both speed and direction with a ıll increase of speed with depth. *Subject Headings:* **1. Ice drift 2. Ocean currents 3. ctic Ocean.**—*E.Z.S.*

12M–827 551.326.7:551.467

Buĭnitskiĭ, V. Kh. (*Leningrad Univ.*), **The regularities and causes of the ice drift in the ar regions of the World Ocean.** *International Oceanographic Congress, 1st, N. Y., 1959, eprints of abstracts of papers.* Issued Wash., D. C., **1959.** p. 530–533. In English and ssian. **DWB** (551.4682 I61pr)—The causes of ice drift in the Arctic and Antarctic are dis-sed. The surface flow and the ice drift indicate that the general ice movement in the Arctic sin is caused by the flow of the cold Arctic surface waters. The movement of sea ice in the tarctic which is freer than in the Arctic Basin, is determined chiefly by the character of the ıospheric circulation there. *Subject Headings:* **1. Ice drift 2. Arctic Ocean 3. Antarctic ean.**—*I.S.*

12M–828 551.501.9:551.507.2:551.326.7:551.467

Collin, A. E. (*Fisheries Res. Board, Canada*), **Oceanographic survey on IGY drift station ravo" T-3.** *U. S. Air Force. Cambridge Research Center, GRD Research Notes,* No. 15: -41, April **1959.** 2 figs. **DWB**—A survey on drift station "Bravo" T-3 of salinity of sea er, water temperature at standard depths and determination of organic phosphate was made ing the summer of 1958. Temperatures as taken in the water of an ice hole aboard the ion are not always reliable. Temperature measurements taken below the 15 ft thick ice e a minimum of − 1.71°C in late May and rose slowly to a maximum of 0.47°C in the middle Aug., dropping uniformly to − 1.30°C on Sept. 29, 1958. At 1000 m depth, the temperature between − 0.09 and − 0.11°C and at 2000 m − 0.37°C. *Subject Headings:* **1. Oceanographic veys 2. IGY drift stations 3. Drift station Bravo T-3 4. Arctic Ocean.**—*W.N.*

12M–829 551.326.7:55
Gudkovich, Z. M. (*Arctic & Antarctic Res. Inst., Leningrad*), **Ice drift in the central A**
Basin. *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of pa*
Issued Wash., D. C., AAAS, **1959.** p. 545–549. fig., table. In English and Russian. I
(551.46082 I61pr)—This paper is based on observations by Soviet expeditions (1937–1956
the drift of ice islands, and hydrological surveys in the Arctic Basin (1948–1956). Sea
variations of pure wind drift characteristics, derived from a comparison of the drift and
for different periods, are described and presented in tabular form. Dynamic current chart
the Arctic Basin are shown and the role of dynamic currents in general drift is explained.
ject Headings: **1. Ice drift calculations 2. Soviet Arctic expeditions 3. Arctic Ocean.**—

12M–830 551.467:551.326.62(
Kusunoki, Kou (*Hokkaido Univ., Japan*), **Oceanographic observations at Ice Island**
U. S. Air Force. Cambridge Research Center, GRD Research Notes, No. 29, Dec. **1959.** p
38. 7 figs. **DWB**—Observations included temperature readings and collecting and testin
water samples at various depths, and measurements of currents. The vertical distributio
temperature showed the presence of the warm Atlantic water layer; the presence of the P
layer is not confirmed as yet. A complex current system is suggested by preliminary computa
The program will be continued and measurements of pH, inorganic salt and ocean currents
be included. The growth of pack ice and physical-chemical properties of pack and islan
will be investigated. *Subject Headings:* **1. Ice Island T-3 2. Pack ice formation 3. A**
Ocean.—*E.Z.S.*

12M–831 551.467:551.326.7(
Lyon, Waldo (*USN Electronics Lab.*), **Arctic problems.** (In: Woods Hole Oceanogr
Institution, Woods Hole, Mass., **Environmental factors influencing the performance of r**
weapon systems. Woods Hole, **1959.** p. 115–124. 6 figs., 5 refs.) **DWB** (M:623.4 W8
—Although the U. S. Fleet now has the summer time capability to operate across the Arctic O
it is imperative to extend this capability to all seasons. This makes necessary further and e
sive research in ocean cryology and engineering. This paper outlines the required scope of A
research. The research requirements can be itemized as: a) intensive study of the ice ca
during winter; b) sound transmission studies during all seasons; and c) continued research i
physics and chemistry, as well as gross scale properties and movement. This paper is illust
graphically and also has photographs of Arctic sea ice. *Subject Headings:* **1. Sea ice 2. A**
Ocean.—*I.S.*

12M–832 551.467:551.501.9:551.326.7(
Morozov, Savva Timofeevich, **U poslednikh paralleleĭ na dreĭfuiushchikh l'dakh ok**
[At the last parallels on drifting ocean ice.] Moscow, Voenizd-vo, **1956.** 245 p. 55 ph
7 maps. **DLC** (G820.M6)—A report on the Soviet research in the Arctic region starts wit
conquest of the North Pole by the expedition of O. Iu. Shmidt and N. V. Vodoplianov in
and the establishment of the drifting scientific station "North Pole-1." During the first po
expedition in 1948 the oceanographers Ia. Ia. Gakkel and V. T. Timofeev discovered a
trough associated with an underwater ridge, called later Lomonosov ridge. A new bathyn
chart was published by Gakkel in 1951. The scientific drifting station North Pole-2 was
lished in 1950 and stations 3 and 4 in 1954. *Subject Headings:* **1. Ice drift 2. Arctic O**
—*S.N.*

12M–833 551.467:551.509.318:551.326.7
Sasaki, T., **On the early visited drift ice on the shore of Okhotsk Sea at Hokk**
Journal of Meteorological Research, Tokyo, 9(2):114:118, March **1957.** 2 figs., 3 tables, 5
eqs. In Japanese. **DWB, DLC**—To produce counterevidence to the traditional theory c
drifting ashore (that sea ice moves by both sea current and wind pressure), the author
several arguments showing that the first day of drifting is a result of a meteorological con
which occurred 10 days earlier. Drift ice may be formed along the coast of the Okhotsl
near Hokkaido, rather than farther north. The first day of drift ice for the period 1939 to
for 6 different areas in the Okhotsk Sea is tabulated by month, and meteorological factor
the 10 days previous to the first day of drift ice for the period of 1943–56 are shown. The a
gives an extensive discussion on the formation of early drift ice, cooling from surface
effectiveness of snowfall, sea current, and wind phenomenon, and sets of equations are pres
Subject Headings: **1. Ice drift 2. Okhotsk Sea.**—*K.C.*

12M–834 551.556.8:551.467:551.326.7:656.61
Sawada, Teruo (*Hakodate Marine Observatory*), **An ice-area navigation on the**
Pacific Ocean. *Hakodate, Japan. Marine Observatory, Bulletin,* No. 6, (Contribution N

ec. **1959.** p. 6–11, of reprint (unidentified) 2 figs., 4 tables, 6 refs. In Japanese; English mmary p. 11. **DWB**—The author investigated the distribution of drift-ice areas based on ports from reconnaissance aircraft or patrol ship along the Okhotsk Sea region in the early age of drift-ice during 1956 to 1958, and found that these ice areas move south along the east ast of Sakhalin. The trajectory of ice area was determined by the ice coverage charts based patrol ship reports, and it was found that the main trajectory nearly coincides with 200 m pth line in the southern Okhotsk Sea, as shown in a figure. On the other hand, from the alysis of surface sea current in the nearby sea region, it was made clear that the trajectory runs ong the counter-clockwise current of the Okhotsk Sea with the velocity of about 0.5 knot. amely, the drift of ice in the early stages is determined by the surface currents in which it is imersed, though the effect of surface wind cannot be ignored. On the speed and the direction ice drift due to the wind, FUKUTOMI explained that they do not depend on the thickness of ice floe, but are the functions of wind velocity and latitude, as shown in two equations, when e ice area has a large extent. He applied this relation to the investigation on the ice area drift, d obtained the relation between the wind-induced currents of ice area and various wind locities, as shown in a table. Consequently, the forecasting as to the first date of the appear- ce of drift-ice area is possible by means of the addition of two vectors, viz., the velocity of rrent-induced drift obtained from the trajectory and the velocity of wind-induced drift estimated om the prognostic weather map, if the ice area distribution on the open sea is obtained by some eans. The author worked out a nomograph for forecasting the ice area appearance on the khotsk coast as shown in a figure. *Subject Headings:* **1. Ice drifting 2. Wind effects on ice ift 3. Drift ice forecasting 4. Okhotsk coast.**—*Author's abstract.*

12M–835 551.467:551.501.9:551.326.7(268)

Treshnikov, A. F. and Tolstikov, E. I., **Dreifuiushchie stantsii v tsentral'noi Arktike evernyĭ Polius-3" i "Severnyĭ Polius-4."** [Drifting Stations "North Pole 3" and "North le 4" in the Central Arctic.] Moscow, Izdatvo Znanie, **1956.** 31 p. 6 figs., 2 tables. **DLC 630.R8T7)**—The study of the meteorological and ice conditions in the Arctic regions is de- ribed with details and illustrations for purposes of weather forecasting for navigation of ships d aircrafts. The early scientific expeditions to the Arctic on the ice-breaker "George Sedov" d drifting stations "North Pole 1 to 5" are briefly outlined with general consideration of the teorological processes developing with the same intensity as it was in the southern latitudes. was found that deep cyclones penetrated into the Arctic during spring-summer periods. The ganization of two drifting stations (NP-3 and NP-4) are discussed in this brochure with ac- unts of the members of the expeditions and scientific equipment. In view of the frequent anging ice conditions, the appearance of cracks and separation of the large ice areas, the work the station was hazardous and the scientific equipment and tents were often removed to safer eas. The results of the meteorological observations are briefly summarized with tabulated data monthly changing temperature. The movements of drifting stations and ice breaker "Sedov" e illustrated on the Arctic region map. The temperature and salinity of the Arctic water in e Pacific and Atlantic basins were measured and tabulated for various depths to 4120 m. The ore intensive cyclonic activities were observed on the Atlantic side of the Arctic than on the cific one. Among other meteorological data observations were made on direction and intensity wind, degree of cloudiness, actinometric data on radiation, reflection, on magnetic disturbances, nospheric pressure at various altitudes. All data and characteristics are outlined. *Subject eadings:* **1. Drifting ice stations 2. Sea ice 3. Marine meteorology 4. Arctic Ocean.** *N.P.S.*

12M–836 551.467:551.326.7:551.464/5(266)

Watanabe, Kozuo (*Hakodate, Japan. Marine Observatory*), **On the first appearance of ift-ice in every winter and the seasonal variation of oceanographic conditions in the uth-western region of the Okhotsk Sea.** *Hakodate, Japan. Marine Observatory, Bulletin,* o. 6 (Contribution No. 7), Dec. **1959.** p. 14–19 of reprint (unidentified). 9 figs., photo, 24 fs. In Japanese; English summary. **DWB**—A report on aerial observations of sea ice in the uth-western region of the Okhotsk Sea carried out in the early part of 1957 and 1958. The ift ice appearing at first in this region came from east of Cape Aniba of Sakhalin in Jan. Then, shown in a figure, increased in amount covering the offing near the coast of Hokkaido until arch. The results of observations are shown in figs. which include an analytical study of drift- velocities, seasonal change of the surface chlorinity distribution, Soya warm current and khotsk cold water mass, low chlorinity water and its distribution pattern, mean temperature and an chlorinity in ten days. In conclusion it is suggested that it may be possible that the drifting ice off the coast of Hokkaido might be due to the flow of the low chlorinity water. *Subject eadings:* **1. Ice drift 2. Sea ice formation 3. Okhotsk Sea.**—*Author's abstract.*

12M–837 551.467:551..

Wilson, James T., **Moving loads on floating ice sheets.** Michigan. Univ. Research stitute, Contract AF 19(604)-1958, Final Report, July **1958.** 22 p. 16 figs. (incl. photo), 8 19 eqs.—A simple theory of the coupling between a moving load and flexural waves generate it in a floating ice sheet is developed. A number of experiments to verify this theory are repo These experiments include measurements of the waves resulting from constant-velocity loads an waves resulting from landing and take-offs. The critical velocity for resonance between the m load and flexural waves will occur at the minimum wave velocity for flexural waves in th sheet. This velocity can be predicted reasonably well from a knowledge of the water depth the ice properties. For a wide range of ice thickness and water depth, this velocity is i range of ordinary vehicular velocities. The experimental data indicate that amplitude at three times as great as the "static" deflection can result when a vehicle travels at a velocity responding to the minimum wave velocity of flexural waves in the ice. *Subject Heading* **Floating ice sheets 2. Load effects on ice.**—*Author's abstract.*

GENERAL DYNAMICS

See also: **Oceanog. for marines** (Zagrodzki), 12M–3; **Beaches and coasts** (K 12M–366.

12M–838 5

Eckart, Carl, **On the need for a revision of the equation of state of sea water.** *Na Research Council, Wash., D. C., Publication* No. 600, **1959.** p. 156–165. 4 figs., 5 refs. (551.4601 C748co)—While it appears that the present equation is not accurate enough, there to be a more general agreement on the objective of the dynamic height calculation before advar What the interpretation of the geostrophic velocity and dynamic height is and why they ar culated should be the criteria for choice of formulas. There are two schools of thought different views on the problems mentioned. *Subject Heading:* **1. Equation of state of sea** —*W.N.*

12M–839 5

Fofonoff, N. P., **Interpretation of oceanographic measurements—thermodynamics.** *tional Research Council, Wash., D. C., Publication* No. 600, **1959.** p. 38–66. 3 figs., 4 t 29 refs., 27 eqs. **DWB** (551.4601 C748co)—Review of the present knowledge of physical erties of sea water is given. Included also are tabulated lists of sources and data. The s components, relationships and effects are then shown mathematically and discussed with a panying graphs. *Subject Headings:* **1. Thermodynamics 2. Oceanographic measureme** *W.N.*

12M–840 5

Muromtsev, A. M., **Primenenie peresechennykh gidrologicheskikh poverkhnoste glubokovodnykh issledovaniiakh.** [Use of intersecting hydrological surfaces in deep research.] *Meteorologiia i Gidrologiia,* Leningrad, No. 2:44–45, Feb. **1956. DWB, D** The author describes the use of intersecting hydrological surfaces that simultaneously reflect the vertical and horizontal distribution of hydrological elements. By means of such surfa is possible to obtain sufficiently complete initial data for investigating the thickness of a s at any given depth in continuous relationship with its surroundings. *Subject Heading:* **1. H graphic surfaces.**—*I.L.D.*

12M–841 525.63:55

Vapniar, D. U., **Metod rascheta kharakteristik prilivnykh iavleniĭ v uskikh zaliv prolivakh s uchetom pridonnogo trennia.** [A method for computing the characteristics of phenomena in narrow bays and straits taking bottom friction into account.] *Meteoroio Gidrologiia,* Moscow, No. 12:15–20, Dec. **1959.** 2 refs., 28 eqs. **DWB, DLC**—The meth approximate computation of the tidal characteristics in a channel of constant and variable and variable depth is described and numerical examples of the computation for the Suez are given. General hydrodynamic equations and Bessel function of the first order are use correlation of the basic factors: width, depth, current velocity, vertical deviation of levels, pa ter of the Coriolis force, friction coefficient, etc. and coordinates of the channel stream. case of complicated configuration of the channel bottom the accuracy of the computation limited to the third polynom. *Subject Headings:* **1. Tides in straits 2. Suez Canal**—

12M–842 551.482:532.493

Vapniar, D. U., **Vliianie treniia na dvizhenie svobodnoĭ prilivnoĭ volny v kanale postoi- nogo secheniia.** [Influence of friction on the motion of a free tide wave in a channel of nstant cross section.] *Meteorologiia i Gidrologiia*, Leningrad, No. 7:21–25, July **1959.** 2 tables, refs., 21 eqs. **DWB, DLC**—In connection with numerical methods of computation of tidal enomenon in small rivers and channels, the author formulates mathematically the friction of e tidal wave moving in shallow water with variable speeds. The wave height depends upon iction and depth of channel, total distance of moving wave and the magnitude of Coriolis force, mputed with Kelvin equation. The results of computation are given in tables and the final alysis and the evaluation of the computation are mentioned. *Subject Headings:* **1. Tides in rers 2. Hydrologic studies.**—*N.P.S.*

12M–843 551.556.8:551.466.3:532.59

Veronis, G. (*Woods Hole Oceanog. Inst.*), **On the transient response of a β-plane ocean.** *eanographical Society of Japan, Journal*, 14(1):1–5, March **1958.** 2 figs., 3 refs., 22 eqs. **WB**—The purpose of this study is to investigate the effects of two mechanisms for the case of ocean which is rotating nonuniformly and which is subjected to a localized wind stress. The chanisms investigated are: 1) horizontal divergence which occurs together with a change in free surface height; 2) the β-effect, which is of a transient nature and due to the variation the Coriolis parameter. The author considers an infinite two-layer ocean of finite depth sumed to be infinite in the horizontal. From the equations of motion and continuity for a id in a rotating system, equations are established governing the surface height, thermocline and rtically averaged velocities in each layer of this mathematical model. The analysis is carried t on the β plane: Coriolis force is considered to be a linear function of latitude when differ- tiated but it is taken to be constant when undifferentiated. By performing the geostrophic proximation, the author obtains a general solution for the geostrophic response of the sea rface to an arbitrary wind stress distribution. The mathematical expression of this solution difficult to calculate. It is simplified in the case of a quasi-nondivergent flow and an approxi- ite solution may be calculated numerically. The numerical results have only a restricted quali- ive significance; boundary effects, inertio-gravity waves and friction are neglected and attention directed toward the quasi-geostrophic response only. The application to a storm of given force d surface permits some interesting conclusions. Both time and space distribution of the free rface deviations are shown. By proceeding along a radial line the change of the surface heights either (a) a point in space as time increases or (b) an instant of time with increasing distance m the origin is indicated. The effect of β is indicated by the symmetry in the eastward direc- n. The surface height is also plotted as a function of time for point 2000 km from the tweak d at points to the E, N and W of the disturbance. The waves of shortest period (five days) cur due east of the tweak and the periods become longer as the direction is rotated east to west. e height of the second peak is one third of that of the first, it occurs six days later. For points ser to the origin, the wave periods would be shorter. *Subject Headings:* **1. Ocean wave opagation 2. Wind stress on water 3. Coriolis force.**—*A.V.*

12M–844 551.465

†Welander, Pierre (*Intntl. Met. Inst., Stockholm*), **On the vertically integrated mass trans- rt in the oceans.** (In: Bolin, Bert (*ed.*), **The atmosphere and the sea in motion.** N. Y., ckefeller Institute Press, **1959.** p. 95–101. 2 figs., 111 refs., 18 eqs.) **DLC**—A computation made of the Sverdrup transport in the oceans between 50°N and 35°S using the annual mean nd-stress field given by Scripps Institution of Oceanography and by Hidaka. It is pointed out at the Sverdrup model calls for the existence not only of boundary currents at the western ges but also of a system of free "jets." One may thus expect an essential non-Sverdrup trans- t even in the open parts of the oceans. For further use a more general transport equation is rived. This equation does not only include the lateral friction but also the effects of time- riation, noncompensation of the horizontal pressure gradient and Ekman bottom friction. *Sub- t Headings:* **1. Sverdrup model 2. Water transport calculations 3. Oceanic studies.**—*thor's abstract.*

TIDES

See also: **Liverpool Observatory** (Doodson), 12M–28; **Earth-tide effects and tides of seas** (Egedal), 12M–365.

Tide Tables

12M–845 525.623:551.466.7

Chalysheva, N. I., **O tochnosti postoiannykh tablits prilivov.** [Accuracy of permanent e tables.] *Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Institut, Trudy*, No. 46:50–64, **1959.** igs., 6 tables, 2 refs. Russian summary p. 64. **DWB**—The accuracy of the characteristics of

tides predicted by permanent tables constructed on the basis of long period observations on
level is evaluated; also the comparative evaluation of the accuracy of permanent tide table
use at present is evaluated. The objective criterion in evaluating the accuracy of predictio
tide characteristics are the graphs of statistical distribution of errors determining the limit
accuracy. The fundamental reference point in these graphs is the probability curve of the accu
of determination of tide characteristics from observations. The permanent tables of tides w
the assumed limits of averaging of the actual data provide a forecasting accuracy that coin
with the reliability of determinations of tide characteristics from observations. This corresp
to the limit of possible accuracy of determination of tide characteristics. The accuracy of pe
nent tide tables is higher than the accuracy of tables issued previously every year. Tables
be improved by estimating aperiodic fluctuations of level for several regions. *Subject Head*
1. Tide table evaluation.—*Author's abstract and I.L.D.*

12M–846 551.466.74:525.69(
*Malle, Bruno, **Tabelle di previsione delle maree per Trieste e l'Adriatico settentric
per l'anno 1958.** [Tide forecasting tables for Trieste and the northern Adriatic for 1
Trieste. Istituto Sperimentale Talassografico, Pubblicazioni, No. 341, **1957.** 15 p. fig., ta
DWB, DLC—Daily tide tables for Trieste and Northern Adriatic Sea for **1958.** Includ
note on the characteristics of the port of Trieste. *Subject Headings:* **1. Tide tables 2. Tri
Italy 3. North Adriatic Sea.**—*E.Z.S.*

12M–847 551.466.74:525.69(
*Malle, Bruno, **Tabelle di previsione delle maree per trieste e l'Adriatico settentric
per l'anno 1959.** [Tide forecasting tables for Trieste and in the northern Adriatic for 1
Trieste. Istituto Sperimentale Talassografico, Pubblicazioni, No. 347, 19 p. All tables.—
tide tables for 1959 at Trieste and Northern Adriatic Sea. *Subject Headings:* **1. Tide t
2. Trieste, Italy 3. North Adriatic Sea.**—*E.Z.S.*

12M–848 551.466.7:
Niun'ko, V. G., **Vspomogatel'nye tablitsy dlia obrabotki prilivno-otlivnykh tech**
[Auxiliary tables for working up the ebb and flow of tides.] *Meteorologiia i Gidrologiia,* L
grad, No. 2: 50–51, March **1958.** table. **DWB, DLC**—A table is presented for analyzing
velocity and direction of tides into components along meridians and parallels. This table d
from other tables in that it is on one page and it is possible to quickly find the components
the meridians and parallels. The use of this table is illustrated. *Subject Heading:* **1. Tide ta**
—*I.L.D.*

12M–849 525.6:551.465:5
Sager, Günther, **Eine kritische Betrachtung zur Einteilung des Ablaufs der halbtäg
Meeresgezeiten in Spring-, Nipp- and Mittzeit.** [Critical comments on the division of
diurnal ocean tides into spring, neap, and mean tide.] *Zeitschrift für Meteorologie,* 13(
184–189, July/Aug. **1959.** 4 figs., 3 tables, 11 eqs. German and English summaries p.
DWB, DLC—The terms spring-tide and neap-tide are permanently used in the theory of
and in nautical sciences without the experts having a satisfactory conception of the time l
The author shows that the spring-tide duration is always exceeded by that of the neap-tide,
related to the ratio of the average spring and neap ranges. The dependency of selected v
of this ratio upon the duration of spring-tide, neap-tide and mean tide is determined. It fo
that the assumption, used in nautical sciences, of an equal length of interval of both sprin
and neap-tide does not apply. *Subject Headings:* **1. Ocean tides 2. Tidal theories.**—*Au
abstract.*

Analyses of Tides

12M–850 525.63:55
Timonov, V. V., **O kinematicheskom analize prilivov.** [Kinematic analysis of t
Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Institut, Trudy, No. 37:185–204, **1959.** 9
foot-notes, 19 refs. Russian summary p. 203–204. **DWB**—Methods used by different inve
tors for the study of tidal currents and for preparation of maps are briefly reviewed and
pared with the recent kinematic method of analysis of tides, started at 1945. To simplify st
of tide dynamics the movements of water during formation of the tidal wave are characte
by specific forms of orbit of moving water particles. The character and position of the
varies with the phase of the current, its level, velocity of special points on the wave profile,
changing position and form of the instantaneous surface level and with the variation of
kinematic characteristics of tidal phenomena. The method of generalization and analys
observation were worked out for the period 1945–50 and called "The kinematic analysis of t
One part of this method is called "method of orbit," which is outlined in the text and illus

:h maps of the examples of tides in the White Sea and English Channel. The other part is led the "method of isohypses and isallohypses," which was illustrated with examples of conuction of co-tidal lines in maximum water and iso-amplitudes drawn for Yellow Sea and Sea Okhotsk. *Subject Headings:* **1. Tidal currents 2. Tidal dynamics 3. White Sea 4. Engh Channel 5. Yellow Sea 6. Okhotsk Sea.**—*N.P.S.*

12M–851 551.466.71:551.464

Vantroys, L., **La détermination des marées au dessus des fonds océaniques.** [Determinan of tides above oceanic beds.] *Académie des Sciences Paris, Comptes rendus,* 245(3):340–3, July 17, **1957.** 1 ref. **DLC**—Description of an analogical model, prepared in the Hydraulic iboratories, which integrates the partial derived equation of waves and make it possible to find clue to the riddle of oceanic tides by using the data obtained from Oceanography (bathymetry), lestial Mechanics (potential generator) and Hydrography (tide on the border of the continental elf). *Subject Heading:* **1. Ocean tide determination models.**—*A.V.*

12M–852 551.461.2:525.6

Bonnefille, R., **Généralisation de la similitude de M. Vantroys en tenant compte de la riation des profondeurs marines.** [The generalization of Vantroys' similarity laws allowing variations in the depth of the sea.] *La Houille Blanche,* Grenoble, 14(5):547–554, Aug. **59.** 13 eqs. French and English summaries p. 547. **DLC**—Vantroys showed that it is ssible to simulate oceanic tides by using stationary scale models on which the Coriolis force neglected. The related similarity laws are formulated in this article and allowance is made for riations in the depth of the sea. The latter consideration makes it necessary to introduce the ncept of a complex similarity scale and to define the conditions for determining conformal presentation of the Earth on the model. *Subject Headings:* **1. Ocean tides 2. Sea depth varions.**—*Author's abstract.*

12M–853 551.465:532.593:525.63

Crease, J. (*Natl. Inst. of Oceanog., Wormley, Surrey*), **The propagation of long waves into semi-infinite channel in a rotating system.** *Journal of Fluid Mechanics,* 4(3):306–320, July **58.** 4 figs., 10 refs., 44 eqs. **DLC.** Reprinted as *National Institute of Oceanography, Worm-, Surrey, England, Collected Reprints,* 6(237), Dec. **1958. DWB**—In this paper the propagan of long waves (tides) into a canal is studied. The canal is assumed to be rotating at connt angular velocity and the depth of the fluid is uniform. The rate of rotation can have a nsiderable effect on the amplitude of the unattenuated modes in the channel. This is due partly the modification of the known solution when the rotation is zero, and partly to the fact that en if there is only a single semi-infinite barrier unattenuated waves of a special type (Kelvin ves) may be propagated in the rotating system into what is normally called the 'shadow' region hind the barrier (Crease 1956). The purpose of this theoretical investigation is to seek a rtial explanation of the behavior of tides and storm surges in the North Sea. For this reason o models of this region are discussed. In example I, the model is of two parallel semi-infinite rriers in the path of a plane progressive wave, and in example II, there are two parallel barriers, e semi-infinite and the other infinite. The ratio of the observed height of the semi-diurnal M_2 e in the North Sea to the height of the incident tide from the Atlantic lies between the results edicted by the two models and is in closer agreement with the model of example I. *Subject adings:* **1. Tide model studies 2. Tide propagation 3. North Sea.**—*Author's summary.*

12M–854 551.466.78:532.593:525.6

*Doodson, A. T. (*Liverpool Obs. and Tidal Inst.*),**Analysis and prediction of tides in shallow ter.** Reprint from *International Hydrographic Review,* May **1957.** 46 p. 2 figs., 8 tables. **WB**—The methods used by the Tidal Institute in the analysis and prediction in shallow water explained. Only a minimum of mathematical arguments are used and special attention is ven to the need for instructions which can be followed by computers. Discussions are conned with the generation of shallow-water tides; the failure of the harmonic method; nonharmonic d direct-harmonic methods. Considerations of harmonic corrections and the choice of harmonic allow-water constitutes the mathematical expansions. Instructions are given for analysis, pretion by using normal tide-predicting machines; the use of special dials, predicting HSWC and o for predictions when diurnal corrections are not required and for analysis when the basic ediction includes some HSWC. An alternative method of prediction of corrections in use ce 1936 is explained. *Subject Headings:* **1. Tides in shallow water 2. Tide prediction.**—*Z.S.*

12M–855 551.466.78:551.556.8:532.596:551.46

Fischer, Günter (*Geophys. Inst. U. Hamburg, Germany*), **Determination of the wind effect d tides in enclosed seas by numerical integration of hydrodynamic differential equations.**

International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers. Issu
Wash., D. C., AAAS, **1959.** p. 751. In English and German. **DWB** (551.46082 I61pr)
Modern electronic computers are utilized to solve numerically the hydrodynamic equations. F
this purpose, vertically integrated equations of motion and the continuity equations are transform
into an explicit system of difference equations, which are solved stepwise in time for the wat
elevations and movements in basins of varying depths. The numerical stability of the differen
system is discussed. Apart from Courant-Friedrichs-Lewy criterion another condition has
be satisfied to assure computational stability. This condition is, that the time step should
smaller than the fraction r/f^2 (r, frictional coefficient, f, Coriolis parameter). In a few simpl
cases the numerical solution is compared with the analytic solution. Several computations
storm surges and tides in the North Sea are presented and are compared with the results of oth
methods or with observations. The computations of tidal waves and currents in the North S
where the wave is prescribed only at the open ends and the normal component of the curren
shall vanish at the coasts, give a reasonable agreement with observed conditions. The influen
of some parameters (mesh size of the grid, smoothing, friction, etc.) is discussed. *Subject Hea
ings:* **1. Tides in enclosed seas 2. Storm surges 3. North Sea.**—*Author's abstract.*

12M–856 551.466.78:525.63:551.4

Groves, Gordon W. and Munk, Walter (*both, Scripps Inst. of Oceanog., La Jolla, Calif*
A note on tidal friction. *Journal of Marine Research,* New Haven, Conn., 17:199–214, 195
fig. 2 tables, 11 refs., 12 eqs. **DWB, DLC**—The Moon's gravitational torque on the ocean ti
has been computed on the basis of Dietrich's cotidal charts. The result is -45×10^{23} dyn
cm as compared to Heiskanen's (1921) value of -2.9×10^{23} dynes cm based on Sterneck
(1920) charts. Both values are subject to great uncertainty. The observed deceleration of t
Moon implies a torque of $(-3.9 \pm 1.0) \times 10^{23}$ dynes cm, which is consistent with both foregoi
calculations. It is concluded that the deceleration of the Moon's orbital motion and the associat
deceleration of the Earth's rotation may be due to oceanic tidal dissipation. The solar decelerati
torque is estimated at 0.31 times that of lunar torque. The forces associated with the decelerati
tidal torque give rise to a minute steady oceanic circulation. *Subject Heading:* **1. Tidal frictio**
—*Authors' abstract.*

12M–857 551.466.71:525.63:551.4

Hidaka, Koji (*Geophysical Inst., Tokyo Univ.*), **Theory of the oceanic tides, Pt. 1.** R
printed from unidentified source as *Tokyo Univ. Geophysical Institute, Geophysical Notes,*
(2), **1958.** Contribution 20. (In Japanese.) 7 eqs. **DLC**—The influence of potential gravit
tion of Moon upon the terrestrial surface (P) is shown in the following formula: $-rM/C$
$M =$ Moon's mass, $r =$ gravitational constant, $C =$ center of Moon. If $OC = D$, $OP = r$, (
$=$ center of Earth, $D =$ distance between O and C), geocentric zenith distance at P is repr
sented by $G(POC)$ then $P = -rM/(D^2 - 2rD \cos Gr^2)^{\frac{1}{2}} C$. From this formula an equilibriu
theory of tides was developed in consideration of equilibrium height that is not dissimilar wi
tide-generating force potential, and of harmonic spheroid of revolution related to terrestrial di
turbance. Preliminary conclusions are as follows: $Hm =$ equilibrium height by Moon and H
$=$ that by Sun, if mean distance from the Earth to terrestrial disturbance is sought for, the rat
should be $Hs/Hm = 0.4615$, or in other words, Hs does not exceed 46% compared to Hm. Sor
different method for tide-raising force potential has been discussed with an extensive equati
when r is a variable. The origin of declinational tide, tide on the Earth, and on the correcti
to the equilibrium theory of tides for the continents, were developed in equations as well as
discussions. *Subject Heading:* **1. Tidal theories.**—*K.C.*

12M–858 551.466.71:525.63:551.4

Hidaka, K. (*Dept. of Geophysics, Tokyo Univ.*), **Theory of oceanic tides, Pt. 2.** Reprint
from unidentified source as *Tokyo. Univ. Geophysical Institute, Geophysical Notes,* 12(1
1959. Contribution No. 10. Table, 15 eqs. **Pt. 3.** *Ibid.,* Contribution No. 11. In Japane
DWB, DLC—The currents near the equator are treated by solving the dynamical equations f
the steady-state involving terms of ellipticity, co-latitude, and gravitational and centrifugal pote
tial of open surface. In reference to dynamic computation of ocean tides the following topi
were considered; Laplace's oscillations of the first-second-third species, long period-one day-ha
day ocean tides when the depth of sea water is constant, the influence of variant water-mass
tide formations, open vibration and gravitation of various water-layer, and finally, lunar and sol
fortnightly tide. *Subject Heading:* **1. Tidal theories.**—*K.C.*

12M–859 551.466.78:551.**526.64**:525.63 532.593:551.4

La Fond, E. C. and Poornachandra, Rao, C., **Vertical oscillations of tidal periods in t
temperature structure of the sea.** *Andhra Univ., Waltair, India, Memoirs in Oceanograp*

109–116, **1954.** 4 figs., 3 tables, 9 refs., eqs. **DLC** (GC1.A55)—Oscillation data obtained by Andhra Univ. in the Bay of Bengal where bathythermographic observations were made for 25 or more on Oct. 29–30, 1952 and Feb. 17–18, 1953, are discussed and compared with results ained by other workers. The comparison of time, of surface and internal high tide for 17 tions in Pacific, Atlantic and Indian Oceans is plotted. It is concluded that individual observa- ns of layer depth are unpredictable and that the 12 and 24 hr lunar cycles indicate that the iternal tide" is linked to the influence of tidal forces on the internal waves. Internal and rface tide phase lag varies with time and position. The relation, probably α IHT $= 4.5 + \alpha$ HW requires further study for conclusive determination. *Subject Headings:* **1. Tidal period cillations 2. Sea temperature structures 3. Bay of Bengal, Indian Ocean.**—*W.N.*

12M–860 551.46

Munk, Walter H. (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Deep-sea tides.** *National search Council, Wash., D. C., Publication,* No. 473:28–31, **1957. DWB** (551.46 N277pr), **LC** (GC57.N33, 1956)—The discussion concerns the measurements of tides in the open sea. e old and new methods of measuring tides, the problems of large computation and observational ficulties as well as the recent achievements in measuring deep sea tides at the new Greenwich servatory at Herstmonceux are discussed. The author has quoted five results of the measure- nt of deep-sea drifts observed by Swallow. *Subject Headings:* **1. Deep-sea tides 2. Ocean le measurements.**—*N.N.*

12M–861 551.466.78:525.63:551.468

Redfield, Alfred C. (*Woods Hole Oceanog. Inst.*), **The influence of the Continental Shelf the tides of the Atlantic coast of the United States.** *Journal of Marine Research,* New aven, Conn., 17:432–448, **1958.** 5 figs., 4 tables, 14 refs. **DWB, DLC**—Examination is made the hypothesis that the tide along the eastern coast of the United States results from co-oscilla- n of water over the Continental Shelf engendered by motion at the continental slope, the barrier ainst which the oceanic tidal wave is reflected. Using methods which are effective in analyzing es in embayments, the range of tide and the time of high water over the continental slope have en estimated from data on the tide at the coast and from the topography of the off-lying shelf. timates indicate that the time of high water and the mean range of tide along the continental pe are much more uniform than those at corresponding positions along the coastline, as con- eration of the velocity of waves in deep and shallow water demands. Estimated mean ranges ong the 1000 m contour agree closely with those observed at oceanic islands in the Northwest lantic. The estimated velocities of tidal motion across the Shelf agree roughly with the locities of tidal currents measured from anchored vessels. It is concluded that the variation local characteristics of the tide along this coast may be explained by the influence of the topog- phy of the Continental Shelf upon tidal motion. The general application of these results is cussed. *Subject Headings:* **1. Tides on the continental shelf 2. Topographic influence on les 3. East coast U. S.**—*Author's abstract.*

12M–862 551.466.71:525.6:551.465:532.59

Supranovich, T. I., **Iz opyta analiza kratkosrochnykh nabliudenii nad prilivnymi iavle- ami.** [The analysis of short-range observations of tidal phenomena.] *Meteorologiia i Gidro- iia,* Leningrad, No. 7:36–37, July **1959.** fig., table, 6 eqs. **DWB, DLC**—Determination of rmonic constant by analysis of daily observation of the tidal wave characteristics at different ints is reviewed with respect to distorting effects of small amplitudes. For higher accuracy a w "navigators" method is introduced with analytical formulation of the semi-daily amplitudes the form of the sum of two member equation. Harmonic constants for amplitudes (H) and ase of the tidal wave (g), are determined from observations made in three separate stations. bles and graphic illustrations are included. *Subject Headings:* **1. Tidal phenomena 2. Tide asurements 3. Tidal wave characteristics.**—*N.P.S.*

12M–863 525.63:551.465

Timonov, V V. (*Oceanog. Inst. Hydromet. Inst., Leningrad*), **Resultant and secondary cur- nts in tidal seas.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts papers.* Issued Wash., D. C., AAAS, **1959.** p. 782–784. 2 figs. In English and Russian. **WB** (551.46082 I61pr)—It is suggested that tidal currents may give rise to resultant and condary currents. A comparison is made of the stream lines of the flood and the ebb and the e of resultant currents in the case of a protruding cape and is graphically illustrated. The sultant spring currents near Portsmouth, computed by British hourly tidal stream charts, are also esented in graphic form. *Subject Headings:* **1. Tidal currents 2. Portsmouth, Eng.**—*I.S.*

12M–864 551.466.71:525.6

Van Roon, J., **De getijstroomen.** [Tides.] *Netherlands. Meteorologisch Instituut, Op- llen op Oceanografisch en Maritiem-Meteorologisch Gebied,* No. 10, **1947.** 44 p. 25 figs.

(*Uitgave* No. 111) **DLC** (GC301.R6)—The descriptive account of tides covers the followi topics: the astronomical causes of tides, the properties of running and standing waves, the natu of tidal movements in bodies of water of different size and depth, the nature of the tidal wav in Lake Geneva, the Red Sea, and the English Channel, the measurement of tides in the ocea and the dynamics of tidal streams. *Subject Headings:* **1. Tidal phenomena 2. Tidal dynami 3. Lake Geneva 4. Red Sea 5. English Channel.**—*I.L.D.*

12M–865

551.466.71:551.46

Vantroys, L., **Structure formelle attachée à l'équation du problème des marées.** [Form structure of the tidal equation.] *La Houille Blanche*, Grenoble, 14(5):533–546, Aug. **19** 2 figs., 9 refs., eqs. French and English summaries p. 533. **DLC**—After making certain a proximations, problem of tides can be formulated as a second order hyperbolic partial different equation in three variables x, y and t. By substituting the associated complex function for sinusoidal function of time, the variable t is eliminated and an elliptic function is obtained. discussion of Cauchy's problem in connection with the equation in its hyperbolic form shows h the characteristic velocity $\sqrt{gh}$ is to be defined; a kinetic consideration of the elementary so tions (sinusoidal waves) brings out the phase velocity and group velocity which are unbound A treatment of these solutions from the standpoint of dynamics leads to the "dynamic velocit $\leq \sqrt{gh}$. The determination of the tide in an area S bounded by a contour Γ when the generati potential is known in S and the reduction in level of normal current is known at every point Γ, which is generally unique, can be sought by summing the elementary solutions, by using Green function, by using Proudman auxiliary functions, or it can be obtained by the calculus variations. *Subject Heading:* **1. Tidal equations.**—*Author's abstract.*

CURRENTS

See also: **Oceanography in IGY** (Deacon), 12M–53; **Studies of electric potential** (Wertheim), 12M–361; **Variations of daily mean sea level and the Kuroshio** (Shoji), 12M–482; **Equatorial undercurrent** (Hidaka, Nagata), 12M–938; **Variations of the Kuroshio** (Fukuoka), 12M–958; **Effect of Kuroshio current on northeasterly wind waves** (Isozaki), 12M–964.

12M–866

551.466.75:551.465:52

Charnock, H., **Tidal friction from currents near the seabed.** *Geophysical Journal*, Lond 2(3):215–221, Sept. **1959.** 5 figs., table, 4 refs., eq. **DWB, DLC**—The current in the low two meters of a tidal stream has been found to increase linearly with the logarithm of the hei above the bottom. Independent measurements of the shearing stress on the sea bed allow determination of von Karman's constant which was found to be approximately 0.4. *Subj Headings:* **1. Tidal currents.**—*Author's abstract.*

12M–867

551.466.753:525.63:551.

Lundberg, O. R., **Vozmozhnosti kharakteristiki prilivnykh techeniĭ po garmonichesk postoiannym.** [Possibilities of a description of tides according to a harmonic function.] *Me orologiia i Gidrologiia*, Leningrad, No. 3:43–45, March **1958.** fig., table, 5 eqs. **DWB, DLC** The variability of tidal currents is extremely difficult to study by means of the harmonic consta of current projections. For this purpose, characteristics combining the harmonic constants both projections (along the meridian and parallel) are needed. By means of these constants ellipse of the constituent tidal currents can be constructed. The characteristic elements of ellipse corresponding to individual constituent waves of the tidal current are regarded as harmo constants of the tidal current. The principal characteristics of the ellipse are as follows: = direction of the large semiaxis; W = magnitude of the large semiaxis; τ = angle of position the large axis is phase angle, characterizing the time when the vector of flow of a given w coincides with the large semiaxis of the ellipse and α = ratio of small to large semiaxis. determination of these characteristics determining the individual flow constituents is achieved the formula of Iu. K. CHERHIAVSKIĬ: phase of the tidal current

$$tg2\tau = \frac{a^2 \sin 2g_u + v^2 \sin 2g_v}{u^2 \cos 2g_u + v^2 \cos 2g_v}$$

directions of the large axis of the ellipse—

$$tg\gamma = \frac{v \cos(\tau - g_v)}{u \cos(\tau - g_u)}$$

gnitude of the large semiaxis of the ellipse—

$$W_{\max} = \sqrt{[v \cos(\tau - gv)]^2 + [u \cos(t - g_u)]^2}$$

re u and gu = harmonic constants of the projections of flow on the meridian (u = velocity, angle of position), v and g_v = harmonic constants of projection on the parallel. The applica- of this method to the analysis of tidal currents and also the computation of semidiurnal and rnal components of tidal oscillations of the surface are illustrated. *Subject Headings:* **1. Tidal rents 2. Harmonic analysis.**—*I.L.D*

12M–868 551.466.753:525.63:551.465

Mikhaĭlov, Iu. D., **Otsenka kachestva nabliudeniĭ nad prilivootlivnymi techeniiami dlia hisleniia garmonicheskikh postoiannykh admiralteĭskim metodom parnoĭ obrabotki.** valuation of the quality of observations on tidal currents for calculating the harmonic constants the Admiralty method of comparative analysis of data for two diurnal cycles.] *Moscow. sudarstvennyĭ Okeanograficheskiĭ Institut, Trudy,* No. 37:178–184, **1959.** 3 figs., 2 tables, 2 s., 5 eqs. Russian summary p. 184. **DWB**—The method of evaluation of the data for rising receding tidal currents is described in detail for calculating the harmonic constants by the hod of combined processing of two diurnal cycles. For harmonic analysis of these currents, the idurnal and diurnal currents were represented by two projections on the meridian and on paral- for further processing. The addition (composing) of two mutually perpendicular frequencies the same period, corresponding to the harmonics of the tide, can be simplified if the semi-durnal diurnal components of the rising and receding tides are represented in the form of ellipses. is method is also described in detail and illustrated by examples and graphs. *Subject Headings:* **Tidal currents 2. Harmonic analysis.**—*N.P.S.*

12M–869 551.466.75:525.623:551.465

Mikhaĭlov, Iu. D., **Tochnost' rascheta prilivo-otlivnykh techeniĭ smeshannogo kharaktera.** ccuracy of computations of mixed type tidal currents.] *Moscow. Gosudarstvennyĭ Okeano- ficheskiĭ Institut, Trudy,* No. 46:41–49, **1959.** 2 figs. (1 fold.), 9 tables. Russian summary 49. **DWB**—In examining the variability of tidal currents as a function of astronomical phe- mena by means of the pilot method of tide forecasting O. R. Lundberg (*Ibid.*), No. 30, 1955 wed that all possible combinations of phasic and tropic inequalities encountered in the first f of the year are generally repeated during the second half. The intra-annual and long period rections of amplitude and phase for individual tidal waves used in predicting by the pilot thod are replaced by their mean monthly long period values, which are presented in a table. e influence of all assumptions involved in calculating tidal currents by this simplified pilot thod of tide forecasting has been investigated and the maximum errors arising as a result of divergence of astronomical phase differences of 24 hour components of tidal currents. cal- ated. Monthly curves of probability of error in the magnitude of the velocity of three knots re obtained. All possible deviations of astronomical phase differences for six years are obtained. *bject Headings:* **1. Tidal currents 2. Tide forecasting techniques.**—*Author's abstract and .D.*

12M–870 551.466.75:525.623:551.465

Nitani, H.; Iwasa, K. and Inada, W., **On the oceanic and tidal current observations in channel by making use of induced electric potential.** *Japan. Maritime Safety Board, drographic Bulletin,* No. 61:14–24, Oct. **1959.** 9 figs., table, 7 refs., 20 eqs. In Japanese; glish summary p. 14.—As sea water is an electrical conductor, there exists an induced potential erence between both sides of the channel in which the current exists. On this basic principle, GGINS, STOMMEL, WERTHEIM, SHOJI, KIYONO EZOE and SUZUKI investigated the relation be- en the tidal current and the induced potential difference in the channel. The authors made ervations at Bisan-Seto and Tsugaru-Strait in 1958 for two weeks. The electric potential erence depends upon the bottom topography, the velocity pattern and the conductivity of nnel bed when even the mass transport is constant. Solution was obtained for arbitrary dis- ution which could be extended to Fourier's double series. In Tsugaru-Strait, assuming the nnel bed as a perfect insulator and mass transport as constant, the potential difference approxi- tely corresponding to actual velocity pattern, is about 50 ~ 60% of that corresponding to uni- m velocity, and this is confirmed with the observed values. Furthermore fairly good accordance s obtained with actual tidal and oceanic current deduced from the tidal prediction and the erence of mean sea levels between both sides of Tsugaru-Strait. The observations show that method with two electrodes set on both sides of the channel is useful for evaluation of the anic current, the tidal current and their mass transport. *Subject Headings:* **1. Tidal current servations 2. Bisan-Seto, Japan 3. Tsugaru Strait, Japan.**—*Authors' abstract.*

12M–871 551.466.753:525.623:551.465:517.51

Ono, K., **Examples of a few tidal streams on a complicated sea.** *Japan. Maritime Saf Board, Hydrographic Bulletin,* No. 61:65–96, Oct. **1959.** 16 figs., 4 tables, 6 eqs. In Japane English summary p. 65.—The Seto-Naikai, the Inland Sea of Japan, has very complicated natu configuration, and the currents of the sea are also complicated. These situations are illustra as follows: 1) in down-stream behind the island, there appear Karman's vortices added to primary current for 20 ~ 30 minutes according to the size of the island and the speed of primary current. (Strouhal's expression makes these phenomena clear); 2) currents in the ch nels. In Ondo-Seto off Kure-Kō, when a primary current flows northward, a contrary curr flows southward for a short duration at about the middle of the northward primary current, vica versa. Generally the tidal current slacks 4 times a day, but in this channel the tidal curr slacks 8 ~ 12 times. This is due to the same cause as in 1 and also in SONDHAUS's experim with "bird-call." The author has the data of observations for 15 consecutive days, and calculated the tidal harmonic constituents for 1, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{6}$, and $\frac{1}{8}$ day period by a simple mann 3) according to the data collected on Mihara-Seto off Omoniti-Kō, the tidal current has peri as short as in the case of 1 and 2. There is no datum that is necessary for fuller explanat and it cannot be explained exactly, however, it is conceivable that the phenomena have to do w island, shoals or channels. When the irregular currents are investigated in the topographic sea the effects of islands, shoals and channels should be considered. *Subject Headings:* **1. Ti currents 2. Seto-Naikai (Inland Sea of Japan).**—*Author's abstract.*

12M–872 551.466.75:525.6:551.

Polukarov, G. V., **Chislennye metody̆ opredeleniia urovnia priliva i skorosti prolivo-otlivn techenii.** [Numerical methods of determining tide levels and velocity of inflowing and outflow tidal currents.] *Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Institut, Trudy,* No. 38: 11 **1957.** 4 figs., 12 refs., 31 eqs. **DWB, DLC**—Since the tide equations for any basin cannot be sol analytically approximate methods of integration are developed, in particular numerical method integrating equations in partial derivation. The system of equations

$$\frac{\partial \zeta}{\partial t} = -\frac{\partial (hu)}{\partial x} - \frac{\partial (hv)}{\partial y},$$

$$\frac{\partial u}{\partial t} - 2\omega v + \partial u = -g\frac{\partial \zeta}{\partial x}$$

and

$$\frac{\partial v}{\partial t} + 2\omega u + \partial v = -g\frac{\partial \zeta}{\partial y}$$

s written in the form of infinite differences. Each corner of the square not lying at the margi the computing region corresponds to a system of algebraic equations with three unknowns; u, (u = velocity component along the meridian in direction of increasing geographic latitude; v = ve ity component along circle of latitude in direction of increase of longitude of a point; ζ = eleva of the free surface above on undisturbed level). The resulting system of algebraic equation solved by successive approximations so that the tide parameters can be determined. The leve a tide is represented analytically by $\zeta = A_o + \Sigma_{(i)} H_i f \cos(\sigma_i{}^t + \epsilon - g_i)$ where A_o = const magnitude equal to the mean value of the level; f and ϵ = astronomical magnitudes depending u t; H and g = harmonic constants corresponding to amplitude and phase, different for different monics and different points of the sea; σ = angular velocity of i^{th} harmonic. The equations ζ, u and v are developed, and by combining them with the above tide equations a system of equa is obtained for solving approximately the following problems: (1) given an oscillation of sea l for the contour of a sea to find the magnitude of oscillation in the open part of the sea and (2) g constituent velocities of tidal currents to find corresponding magnitudes of velocities on the c sea. The numerical method of integration of tide equations and the computations of the velo of tidal flow from known values of level are presented. *Subject Headings:* **1. Tidal currents Tide level forecasting.**—*I.L.D.*

CIRCULATION

See also: **General circulation of Pacific** (Hidako), 12M–932; **Unusual conditions in the Pacific** (Isaacs, Sette), 12M–933.

12M–873 551.465.45(

Rotschi, Henri (*Maître de recherches à l'O.R.S.T.O. M. Océanie*), **Remarques sur la culation océanique entre la Nouvelle-Calédonie et l'Ile Norfolk.** [Notes on oceanic circula between New Caledonia and Norfolk Island.] *France. Comité Central d'Océanographie*

tude des Côtes, Cahiers Océanographiques, 11(6):416–424, June **1959.** 3 figs., 4 refs. nch and English summaries, p. 417. **DLC, DWB**—The dynamical topography of the surface sus 1000 decibars between New Caledonia and Norfolk Island shows the presence of two ents of opposite directions, one transports Pacific water into the Coral Sea, the other trans- s toward the east water of Coral Sea origin. The transport balance is a displacement towards west of a volume of 5 million m^3/sec, this transport being effective mainly in the deeper layers. *ject Headings:* **1. Oceanic circultion 2. Water masses 3. New Caledonia 4. Norfolk nds.**—*Author's abstract.*

Ekman Problem

12M–874 551.465.152

Saint-Guily, B. (*Museum Natural History, Paris*), **Remarks on vertical movements in the ans.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* ied Wash., D. C., AAAS, **1959.** p. 518–520. In English and French. **DWB**—The possibility generalizing Ekman's theory by taking into account density heterogeneities and vertical move- its is explained. It is shown that in case of open sea, slight heterogeneities of water and ionary motion, a partial differential equation may be devised which will explain the slope he sea as well as the density field and the wind stress. A consideration of additional factors n as convection and eddy diffusivity may improve the theory but the problem would no longer inear. *Subject Headings:* **1. Vertical motion theories 2. Ekman's theory.**—*I.S.*

12M–875 551.465.15

Saint-Guily, Bernard, **Sur la solution du Problème d'Ekman.** [Solution of the Ekman blem.] *Deutsche Hydrographische Zeitschrift,* Hamburg, 12(26):262–270, Dec. **1959.** 2 figs., efs., 30 eqs. English, German and French summaries p. 262. **DWB, DLC**—The following its may be covered by the term Ekman problem: Mass Transport caused by: 1) wind fold closed ocean; 2) in a closed ocean by a field consisting of sources and sinks at the sea sur- e and 3) in an open ocean by some transport on its boundary. These problems have the form a Dirichlet problem. They can be solved by an analysis for oceans that are limited by a ple geometric curve and by analogous computation (rheoelectric basin of variable depth) or by e differential calculus (resistance grid or electronic computer) for real oceans. *Subject Head- :* **1. Ekman problem 2. Water mass transport.**—*Author's summary.*

Radiological Tracing

12M–876 551.465:550.9:539.16:546.26

Ewing, Maurice and Gerard, Robert D. (*both, Lamont Geological Obs., Palisades, N. Y.*), **liological studies in the investigation of ocean circulation.** *National Research Council, sh., D. C., Publication,* No. 473:58–66, **1957.** 3 figs. **DWB** (551.46 N277pr), **DLC** (GC57.- 3, 1956)—The discovery of the radiocarbon method of dating and that of natural tritium in ace water has greatly increased the chance of solving oceanographic problems. This paper orts many results obtained from the investigations of ocean circulation. *Subject Headings:* **Radiocarbon dating 2. Oceanic circulation.**—*N.N.*

12M–877 551.465.1

Bohnecke, G. (*German Hydrographic Inst., Hamburg*), **Remarks about the method of estigation into oceanic circulation.** (In: UNESCO Symposium on Physical Oceanography, yo, Oct. 1955, **Proceedings,** pub. **1957.** p. 17–19. table. French summary, p. 17.) **DWB** scheme is set up to serve as a guide to discuss oceanic circulation in the UNESCO symposium. hods are arbitrarily divided into qualitative and quantitative units. Quantitative methods are d to study properties such as current velocity and direction and to given numerical values of ring water. Qualitative methods are used in studying physical and chemical properties, the pended matter and the sediments, which furnish data used in distinguishing different water ses from one another. *Subject Heading:* **1. Oceanic circulation.**—*E.Z.S.*

12M–878 551.465.1(265/266)

Deacon, G. E. R. (*Nat. Inst. of Oceanog., Wormley, Godalming, Surrey, England*), **The er circulation in the Pacific Ocean.** (In: UNESCO Symposium on Physical Oceanography, yo, Oct. 1955, **Proceedings,** pub. **1957.** p. 114–115. 7 refs. French summary, p. 114.) **VB**—A review of the present state of knowledge of oceanography which is obviously deficient. most outstanding need is for actual measurements of speed and direction of the deep water ents, and a detailed picture of the temperature and salinity distribution will also be required. *ject Headings:* **1. Deep water circulation 2. Pacific Ocean.**—*E.Z.S.*

12M–879 551.465.1

Hidaka, Koji and Iida, Hayato, **On the influence of the Earth's rotation and the dimen- of the oceans.** *Oceanographical Society of Japan, Journal,* 13(4):123–126, **1957.** 6 figs., 2 refs., 17 eqs. Reprinted as *Tokyo. Univ. Geophysical Institute, Geophysical Notes,* 11(Contribution No. 8, **1958. DWB**—An attempt is made to tackle the question: On what s body of water will the effect of the Earth's rotation on its circulation become prominent? T is only possible if we utilize the horizontal eddy viscosity. This effect of the Earth's rotation first perceptible when the critical value of a quantity $\mu = A^3\beta/At$ exceeds 185.6. This correspo to a basin about 300–500 km across for the generally accepted values 10^7–10^8 of the coefficie of lateral eddy viscosity. *Subject Heading:* **1. Ocean circulation.**—*Authors' abstract.*

12M–880 551.46

Ichiye, Takashi (*Ocean. Inst. Fla. State U. Tallahassee*), **A theory of circulation in a tw layer ocean and its application to the formation of the intermediate water.** *Internatio Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. AAAS, **1959.** p. 551–552. French summary p. 552. **DWB** (551.46082 I61pr)—Two mat matical models to explain the oceanic circulation by wind and density variations are discussed this paper. In the first model the thickness and horizontal velocity of each layer are assum to be constant and wind stresses are considered to act in the upper layer only. In the sec model the lower layer is assumed to have a density which increases as an exponential function depth. *Subject Headings:* **1. Oceanic circulation theories 2. Mathematical models 3. termediate water formation.**—*I.S.*

12M–881 .1:551.46

Koshliakov, M. N., **Nekotorye voprosy obshcheĭ tsirkuliatsii vod okeanov.** [Some pr lems of the general circulation of oceanic waters.] *Akademiia Nauk SSSR, Izvestiia, Ser. Ge* No. 4:11–23, July/Aug. **1958.** 18 refs., 8 figs. **DWB**—The convectional wind circulation in oceans is considered and analyzed in detail. Certain hypotheses regarding the dynamics structure of oceanic circulation, as applied to the geographic parameters are considered. T theory of STOKMAN and MUNK is mentioned. Several examples, based on the data of vari oceanographic expeditions are given and discussed. Many factors contributing to water circu tion are analyzed. *Subject Heading:* **1. Oceanic circulation.**—*B.J.G.*

12M–882 551.465.1(261

Lauwerier, H. A., **Free motions in a rotating sea which has the form of a semi-infin strip.** *Amsterdam. Mathematisch Centrum, Afdeeling Toegepaste Wiskunde, Rapport* TW **1958.** p. 1–13. mostly eqs. **DWB** [M(055) A528ra]—Differential and boundary equations derived for the free motions of a rotating shallow sea of constant depth. The investigation one of a series conducted by the Applied Mathematics Division of the Amsterdam Mathemati Center in connection with the free motion problems of the North Sea. No account is given h of the influence of the ocean. *Subject Heading:* **1. Free motions in a rotating sea.**—*N.N.*

12M–883 551.543:551.577:551.573:551.46

Lenz, Kurt, **Die Wirkung von Luftdruck, Niederschlag und Verdunstung auf die Ob flächengestalt eines Ozeans.** [The effect of atmospheric pressure, precipitation and evaporat on the form of an ocean surface.] *Acta Hydrophysica,* Berlin, 5(1):39–50, **1958.** 4 figs., 9 re 30 eqs. German summary p. 39. **DLC**—The model discussed is an infinite ocean under hyd static pressure and of constant depth. Using a formal approach, which permits expressing variations of level explicitly as functions of the initial coefficient, the water surface deformati as caused by traveling air pressure, the precipitation and evaporation fields are calculated. *S ject Heading:* **1. Water surface deformation.**—*W.N.*

12M–884 551.513:551.556.8:551.465.15(2

Miyazaki, Masamori (*Japan Met. Agency, Tokyo*), **Note on the zonal circulation in Antarctic Ocean.** *Oceanographical Society of Japan, Journal* 14(1):7:9, March **1958.** 2 fi 8 refs., 5 eqs. **DWB**—A dilemma on the dynamics of the Antarctic circumpolar current the author to check on the elementary assumptions on zonal circulation induced by zonal wi The frictional stress in this area is likely to be too small to balance the surface stress exerted winds. Observations suggest that the flow in the Antarctic Ocean is essentially zonal. Eq tions are given for computing the numerical pattern of wind stress; the mean current speed w respect to depth; and bottom friction. From these relations, the author derives an equation wh determines the eastward mass transport for purely zonal circulation, in function of depth, distance along a meridian from the south pole, the lateral eddy viscosity μ and the vertical e viscosity v. The relative pattern of mass transport is determined by the ratio v/μ and relat patterns are computed for some representative values of μ/v. Plotted variations of total m transport show that total transport increases with the decreasing value of μ as long as v rem stant; they indicate also that the total transport value corresponds to far larger values of v fficient than those estimated in other major oceans. However some knowledge is obtained on state of permanent flow in the Antarctic Ocean, the author concludes that it cannot be decided initely whether it is laminar or turbulent in the deep sea. *Subject Headings:* **1. Antarctic cumpolar Current 2. Zonal circulation 3. Wind effects on water 4. Eddy viscosity Antarctic ocean.**—*A.V.*

12M–885 551.465:681.142

Mohamed Hassan, El Sayed, **The use of digital computers for the solution of the ocean culation problems.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of tracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 550–551. French summary p. 551. **VB** (551.46082 I61pr)—To determine the internal structure of the steady state motion and ect of the bottom topography on the steady state circulation, a model of a wind-driven ocean is isidered. The assumptions involved in the model and the boundary conditions are listed. The izontal currents are expressed as Fourier coefficients in the vertical direction. The first Fourier fficient for the meridional velocity was calculated on an IBM 650 calculator. The results point the potentiality of the electronic computers in calculating the characteristics of the ocean ciently. *Subject Headings:* **1. Ocean circulation 2. Oceanic models 3. Digital computers.** *.S.*

12M–886 551.465.41

Stommel, Henry (*Woods Hole Oceanog. Inst., Mass.*), **What do we want to know about the ep ocean circulation?** *National Research Council, Wash., D. C., Publication* No. 473:19–24, 57. 2 figs. **DWB** (551.46 N277pr), **DLC** (GC57. N33, 1956)—Problems of the deep ocean culation are classified as those of: (a) determining the level of no motion; (b) the distribution vertical velocity; (c) the nature of mixing across isentropic surfaces and (d) the reason for existence of the main thermocline in ocean circulation. The author presents suggestions ich might be solutions to some of these problems. *Subject Headings:* **1. Oceanic circulation Thermocline.**—*N.N.*

12M–887 551.511.536.22:551.465.41

Takano, Kenzo (*Geophysical Inst., Tokyo Univ., Japan*), **Note on the convective circulation.** : UNESCO Symposium on Physical Oceanography, Tokyo, Oct. 1955, **Proceedings, pub. 1957.** 138. 3 refs. French summary p. 138.) **DWB**—A brief note discussing convective circula- in a rectangular basin and in an enclosed basin, and the effect of the meridional variation on Coriolis parameter. *Subject Headings:* **1. Convective circulation 2. Coriolis parameter.** *.Z.S.*

12M–888 551.465.41

†Takano, Kenzo (*Stagiaire à la Faculté des Sciences de Grenoble*), **Sur la circulation océani- e.** [Circulation of the ocean.] *France. Comité Central d'Océanographie et d'Etudes des tes, Cahiers Oceanographiques,* 11(9):644.660, Nov. **1959.** 2 tables, 11 refs., 28 eqs. French nmary p. 644. **DLC, DWB**—The author considers (theoretically) the general circulation in a tangular ocean, by using three components of velocity instead of the classic method of mass nsport. Consideration is also given to the role of convection currents, currents induced by id, the relations between the distribution of density, and influence of the force of the wind the general circulation where the vertical velocity disappears in all directions. *Subject Head- s:* **1. Oceanic circulation 2. Convection currents 3. Wind effects on currents.**—*E.Z.S.*

12M–889 551.511:551.465.41

Tareev, B. A., **O svobodnoi konvektsii v glubokovodnykh vpadinakh okeanov.** [Free vection in abyssal oceanic depressions.] *Akademiia Nauk SSSR, Doklady,* 127(5):1005–1008, 9. 1 fig., 4 refs., 16 eqs. **DWB, DLC**—The possible origin of convective circulation in deep anic depressions is examined. From the linearized system of differential for free convection, ing into account the Earth's rotation, the author develops equations with which it is shown t the effect of the vertical component of the Coriolis parameter increases stability and reduces horizontal extension of circulation cells, and that the role of the meridional component of the ular velocity of the Earth does not influences the size of the circulation cells but the critical ynolds number R increases linearly with

$$Q_y(Q_y) = \frac{f_y{}^2 h^4}{v^2}$$

ere f_y = component of the Coriolis parameter along the meridian, h = thickness of the con- tive layer, v = coefficient of kinematic elasticity. Accordingly the influence of meridional and vertical components of velocity of Earth's rotation leads to an increase in the critical Reynolds number determining the possible formation of stationary convective circulation. *Subjec Headings:* **1. Convective circulation 2. Earth's rotation influences 3. Abyssal oceanic convection.**—*I.L.D.*

12M–890 551.465.4

Veronis, George, **Thermal circulation.** *Oceanus,* Woods Hole, Mass., 5(3/4):19–25, 195 3 figs. **DLC**—During the IGY the movement of ocean water masses are being studied an predictions of deep currents made as shown by a chart. Among the pioneers for the prope understanding of the general circulation of ocean masses are the following: Goldsboroug Henry Stommel, John B. Swallow, Munk, Carrier and Georg Wüst. Their contribution are discussed and the concept that the ocean has a strong thermal circulation is reviewed. *Subjec Headings:* **1. Ocean water masses 2. Thermal circulation in the ocean.**—*N.N.*

Ocean Current Models

12M–891 551.4

von Arx, William S., **Experimental approach to problems in physical oceanograph** *Physics and Chemistry of the Earth,* Vol. 2. N. Y. Pergamon Press, **1957.** p. 1–29. 10 fig (incl. photos), bibliog. p. 28–29, 11 eqs. **DWB** (551P578), **DLC** (GC501.P53)—A review recent model experiments on wind, current, tide and other coastal phenomena, and planetar models of oceanic circulation, vorticity, etc. Models for both the Northern and Southern Hem sphere are described and illustrated in color. The simple models reproduce the actual circulatio in a recognizable form. Atmospheric parameters are simulated in rough form, seasonal variation in wind, effects of heating on shearing stability, and effect of baroclinicity are still to be inco porated in the models. *Subject Headings* **1. Ocean model experiments 2. Oceanic circulatio** —*M.R.*

12M–892 551.46

von Arx, William (*Woods Hole Oceanog. Inst., Mass.*), **On the promise and limitations ocean model experiments.** *National Research Council, Wash., D. C., Publication* No. 473:45–4 **1957.** fig. **DWB** (551.46 N277pr), **DLC** (GC57.N33, 1956)—The magnitude of oceans and th lack of a system of synoptic description constitute a major handicap in our endeavor to understan its physical make-up. Ocean models and laboratory research constitute our only source of obtai ing information on the deep circulation and the baroclinic modes of motion. But these ha specific limitations which are discussed. *Subject Heading:* **1. Ocean circulation models.**—*N.*

12M–893 551.465:551.46

Wooster, Warren S. (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Use of descriptive data studying oceanic circulation.** *National Research Council, Wash., D. C., Publication,* No. 47 32–37, **1957.** 4 figs. **DWB** (551.46 N277pr), **DLC** (GC57.N33, 1956)—The author has broug together the existing oceanographic data for the Pacific and has described in general the cha acteristic features of the circulation of the Pacific. Emphasis is placed on the fact that the studies were much concerned with direct observations of velocity and quick measurements thermal structure rather than with the classical types of measurement. *Subject Headings:* **Oceanic circulation 2. Ocean current velocities 3. Pacific Ocean.**—*N.N.*

UPWELLING

12M–894 551.501.5:551.556.8:551.465.

Ryzhkov, Iu. G., **Raschet razvitiia sgonnogo iavleniia v glubokom more.** [Caluculati of the development of upwelling in a deep sea.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofi* No. 9:1432–1433, Sept. **1959.** Transl. into English in the corresponding number of its *Bullet of the Academy of Sciences Geophysics Series.* fig., 4 refs. **DLC**—The author presents a nom gram for calculating the vertical and horizontal scale of upwelling of water to the surface of sea. This nomogram was constructed for equilibrium phenomena which arise after uninterrupt wind action after 10–11 hrs and for a deep sea with stratified water layers so that the mechanis of upwelling differs substantially from the analogous circulation in shallow water. In the nom gram the wind velocity is marked on the abscissa and ordinates. The radii correspond to t determined wind direction relative to the shore line. The radius coinciding with the directi of the horizontal axis of the nomogram corresponds to the wind directed along the shore li Each curve on the nomogram represents values characterizing the dimensions of upwelling p duced by a given wind. The use of the nomogram is illustrated with the aid of actual exampl *Subject Heading:* **1. Upwelling nomograms.**—*I.L.D.*

12M–895 551.465.46:551.468

Yoshida, Kozo and Mao, Han-Lee, **A theory of upwelling of large horizontal extent.** *Jour- of Marine Research*, New Haven, Conn., 16(1):40–54, **1957.** 3 figs., table, 17 refs., 12 eqs. printed as *Tokyo. Univ. Geophysical Institute, Geophysical Notes*, 12(1), **1959.** Contribu- 14. **DWB, DLC**—Based on certain hypotheses, vertical motion in the upper layers is found be related to the poleward transport in the lower layers. Upwelling off the California coast, ed on recent data, is examined; the theoretical result appears to be confirmed by comparison h other independent indications. A new method of locating regions of upwelling with the roximate velocity is proposed. *Subject Heading:* **1. Upwelling 2. California Coast.**—*thors' abstract.*

12M–896 551.465.46:551.468

Yoshida, Kozo (*Geophysical Inst., Tokyo Univ.*), **Coastal upwelling, coastal currents and ir variations.** *Records of Oceanographic Works in Japan*, Tokyo, Special Number, No. 2:85– March **1958.** table, 5 refs., 7 eqs. **DWB**—The upwelling process along continental coasts of great importance to biological conditions in the coastal waters. In addition to its direct ct through the upward transport of nutrient-rich waters into the euphotic zone, the upwelling st also give indirect effects through the variations in coastal circulation which is associated h changes in density distributions due to vertical advection of mass and also with horizontal ergence of the motion. No satisfactory study on the dynamics, which may relate quantitatively velling to the associated coastal currents, has ever been made. Especially, the time transient blems are worth considering, since most of the coastal upwelling is likely to be seasonal or rmittent, and upwelling leads essentially to changes in mass distributions. In connection with tain specific areas, layers and periods, what we need should not be the average distribution of perties and motions which might be obtained from the usual survey with wide spacing of the ervations and without regard to time changes. The interpretation as well as the planning of observations should require more understanding on the nature of variations in oceanic cir- ation. Thus, some theoretical consideration on time changes in the oceanic motions and their endence upon scales of the phenomena concerned might give us a rough idea concerning how ckly and how densely we should cover the specified areas in order to obtain any results of ain significance. Only a summary of theoretical studies is given in this paper which the sent author has made in connection with the problems as described above. *Subject Headings:* **Coastal current variations 2. Upwelling.**—*Author's abstract.*

12M–897 551.465.46(266)

Yoshida, Kozo and Tsuchiya, Mizuki (*both, Geophysical Inst., Tokyo Univ.*), **Northward v in lower layers as an indicator of coastal upwelling.** *Records of Oceanographic Works Japan*, Tokyo, N.s. 4(1):14:22, Dec. **1957.** figs., 9 refs., 8 eqs. Reprinted as *Tokyo. Univ. physical Institute, Geophysical Notes*, 11(2), **1958.** Contribution 17. **DLC**—Some vertical tions taken daily normal to the California coast show that the isotherms in the upper layers rise ard the coast while those in lower layers fall toward the coast. The validity of this balance been examined in California waters. The mean annual oscillation along the Pacific coast ws an amplitude of 5 to 10 cm. The northward deep current produces convergence due to etary vorticity, and consequently upwelling occurs. *Subject Headings:* **1. Upwelling 2. cific Ocean 3. California coast.**—*A.H.K.*

12M–898 551.465.46(265,266)

Austin, Thomas S. and Rinkel, Murice O. (*both, U. S. Fish and Wildlife, Honolulu*), **Varia- s in upwelling in the Equatorial Pacific.** *Pacific Science Congress, 9th, Bangkok, 1957, ceedings*, Vol. 16, pub. **1958.** p. 67–71. 5 figs., 13 refs. **DWB** [M(06)P117p]—A dis- sion of east-west variations in upwelling in the Equatorial Pacific based on the results of lies made by the (POFI) and published data from the western Pacific. The Pacific Oceanic nery Investigations of the U. S. Fish and Wildlife Service has been investigating the tuna urces of the central equatorial Pacific since early 1950. This program included a number ruises to describe the physical and chemical environment of those important commercial fishes the data thus gathered form in part the basis of this study. From the available data (includ- meteorological data) the authors have shown, with the aid of a variety of charts that there are ations in upwelling along the equator in the Pacific. The most persistent and pronounced elling is to be found in the eastern and central Pacific, decreasing or being absent in the tern Pacific. It is pointed out that meteorological data from the Equatorial Pacific are scarce, it is difficult to derive more than a general picture of the surface wind flow. *Subject Head-* **1. Upwelling variations 2. Equatorial Pacific.**—*E.Z.S.*

12M–899 551.465.

Chew, Frank (*Marine Lab., Univ. Miami*), **Friction induced upwelling in the Floric current.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts papers.* Issued Wash., D. C., AAAS, **1959.** p. 537–539. eqs. French summary p. 539. **DW** (551.46082 I61 pr)—The (GEK) observed surface transverse component of the Florida Curre is taken as kinematic evidence for upwelling when conservation of mass is considered. It explained that the observed westward transverse motion is a consequence of the frictional effe of the strait wall and represents the organized advection of momentum through the boundary ar is equal in magnitude to the excess of turbulent flux of momentum per unit area out of the wester border of the current over that coming into the zone across the boundary. The immediate sour of this organized westward transport of momentum lies in the broad upwelling region to the ea of the 10 km zone. The downhill flow is the source of momentum flux entering the 10 km zon Considering mass continuity, upwelling here represents a release of potential energy stored the form of higher sea level in the Gulf of Mexico. But for the upwelling mechanism describ here, downhill flow is not essential. It appears likely that local wind can induce upwellin *Subject Headings:* **1. Upwelling 2. Florida current.**—*I.S.*

12M–900 551.465.

Cromwell, Townsend, **Thermocline topography, horizontal currents and "ridging" in tl Eastern Tropical Pacific.** *Inter-American Tropical Tuna Commission, Bulletin,* 3(3):135–15 **1958.** 6 figs. Reprinted as *California Univ. Scripps Institution of Oceanography, Contributio* 1959, issued **1960.** p. 1099–1118. **DWB** (551.46 C153co)—This paper presents some results work in physical oceanography which will be useful to biological work and of interest to oceano raphers in other specialties. The thermocline is very close to the sea surface in a region Costa Rica and is the main object of this study. Thermocline topography is represented by co siderable detail, seasonal charts show the thermocline depth over the entire Eastern Tropic Pacific. Ridges and troughs are oriented roughly east-west. The topography of the thermocli as presented in the charts gives information about the geostrophic current. The data indicate th vertical motion of differing types occurs in the tropical Pacific. The indiscriminate use of t term upwelling is pointed out. Divergence of surface water moved by the wind and a continui replacement from below seem still to be a basic ingredient of the upwelling process. It is not that at the north boundary of the Equatorial countercurrent, the conditions are different. He the surface layer is not phosphate rich and its density is low. It is known that the thermocli rises and falls at this boundary but the water motion is of a different nature than that occurri in regions of upwelling—this motion is defined as ridging. Vertical stirring and mixing induc at the ocean surface is discussed. Results of tank experiments suggest that vertical stirring a mixing have the effect of increasing surface layer thickness (or thermocline depth) and that t rate of surface layer thickening is exponentially related to thermocline depth. *Subject Heading* **1. Upwelling 2. Thermocline 3. Ridging 4. Horizontal currents 5 Eastern Tropic Pacific.**—*E.Z.S.*

12M–901 551.556.8:551.465.46:551.46

La Fond, E. C., **On upwelling and sinking off the east coast of India.** *Andhra Uni Waltair, India, Memoirs in Oceanography,* 1:117–121, **1954.** 2 figs., 7 refs. **DLC** (GC1.A55) The upwelling and sinking of sea water is recognized in variations of the surface temperatures a salinity. Observations conducted off Visakhapatnam, Oct. 1952–May, 1953 show that upwelli takes place from March to May and sinking from Sept. to Nov. Data on the seasonal cycles presented in graphic form and discussed on the basis of bimonthly conditions. *Subject Heading* **1. Upwelling 2. East coast of India.**—*W.N.*

12M–902 551.465

Ramanadham, R. and Varadachari, V. V. R. (*both, Andhra Univ., Waltair, India*), **Upw ing and sinking in the coastal waters off Waltair on the east coast of India.** *Internatio Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. AAAS, **1959.** p. 895–896. **DWB** (551.46082 I61pr)—An investigation of some of the me orological and oceanographic features off Waltair (latitude 17°43′N, longitude 83°20′E) in re tion to upwelling and sinking and limited to the coastal waters up to the edge of the continer shelf was made during the oceanographic cruises of Andhra Univ. from 1952 to 1957. This vestigation proves conclusively the existence of vertical circulation in the coastal waters off Walt and its relation to the northeasterly and southwesterly currents. *Subject Headings:* **1. Upwelli and sinking 2. Coastal waters 3. Andhra University oceanographic cruises (1952– 4. Waltair, India.**—*I.S.*

12M–903 551.556.8:551.465.46

Rodriguez P., Franklin R. (*Panama*), **Effect of upwelling in the Gulf of Panama.** *Inter- ional Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued ash., D. C., AAAS, **1959.** p. 898–899. In English and Spanish. **DWB** (551.46082 I61pr)—ery year, during the dry season (Jan.–April), the north wind pushes the coastal warm surface ter toward the outside of the Gulf of Panama, resulting in the upwelling of colder and heavier ter, which stays near the bottom of the ocean for eight or nine months. This is the interesting enomenon of "upwelling" which has been studied by Richard Fleming (1940) and Milner B. haeffer (1958) and others. The cold water brings up great quantities of fertilizers that form initial basis of the food chain from which the marine fauna feeds. Our marine wealth is med by two big fisheries: the famous Panamanian shrimp, whose production in 1957 was 62,000 pounds with an F.O.B. value of B/.6,181,000.00 and the anchoveta which is utilized live bait by the tuna boats. Upwelling is the phenomenon responsible for this high marine ductivity in the Gulf of Panama. The north winds do not blow every year with the same ensity; as a result the upwelling is subject to annual variations, changing the annual marine duction. *Subject Headings:* **1. Upwelling 2. Gulf of Panama.**—*Author's abstract.*

12M–904 551.465.46:551.468

Schweigger, Erwin (*Dept. de Oceanog. a Ictiologia, Lima, Peru*), **Upwelling along the coast Peru.** *Oceanographical Society of Japan, Tokyo, Journal,* 14(3):87–91, Oct. **1958.** 3 figs., refs. **DWB**—A detailed description of the upwelling along the Peruvian and part of the ilean coast is given. For this purpose the whole shoreline under consideration has been sepa- ed in various sections and the different phenomena of upwelling in each one of them are wn. *Subject Headings:* **1. Upwelling 2. Peruvian coast 3. Chilean coast.**—*Author's tract.*

12M–905 551.465.46

Taylor, C. B. and Stewart, H. B., Jr. (*U. S. Coast and Geodetic Survey*), **Summer upwelling ng the East coast of Florida.** *Journal of Geophysical Research,* Wash., D. C., 64(1):33–40, . **1959.** 6 figs., 2 tables, 19 refs. **DLC**—Daily sea-water temperature measurements made at e stations by the U. S. Coast and Geodetic Survey reveal anomalously low water temperatures ing most summers at stations along the northern half of the east coast of Florida. The periods colder water are accompanied by a lowering of sea level and by winds from directions most ducive to producing upwelling. Examination of daily variations in these factors at Daytona ach during a year when the summer drop in mean water temperature exceeded 10°F shows the endence of upwelling on the prevailing winds and suggests that the upwelling mechanism has no mentum but ceases at the coast as soon as the driving force is terminated. *Subject Headings:* **Upwelling 2. Temperature variations 3. East Coast of Florida.**—*Authors' abstract.*

12M–906 551.556.8:551.465.46(266)

Yoshida, Kozo (*Geophysical Inst., Tokyo Univ., Japan*), **Coastal upwelling off the California st, and its effects on productivity of the waters.** (In: UNESCO Symposium on Physical eanography, Tokyo Oct. 1955, **Proceedings,** pub. **1957.** p. 104–106. ref., 2 eqs. French mary p. 104.) **DWB**—Upwelling processes localized along the coast are interpreted as bound- phenomena, limited at distances less than 50 to 100 km from the coast. This occurrence is ored in cases when northerly winds parallel the coast. The speed of upwelling is measured by average speed of these winds. Quantitative prediction for the surface currents would be sible on the basis of wind information from daily weather maps. *Subject Headings:* **1. Up- ling 2. California coast.**—*E.Z.S.*

12M–907 551.465.46

Yoshida, Kozo (*Geophys. Inst. Tokyo Univ. Japan*), **Certain boundary phenomena in the ans, Pt. 1; Coastal circulation and equatorial circulation, with special reference to the velling and undercurrents.** *International Oceanographic Congress, 1st, N. Y., 1959, Pre- ts of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 525–526. German sum- y p. 526. **DWB**—This paper is based on the information provided by explorations during the ten years of the equatorial regions in the Central and Eastern Pacific. A similarity is erved in the circulation and distribution of properties between the zones very near coasts and y near the equator. This feature is discussed with special reference to the analogies between stal upwelling and equatorial upwelling between undercurrents in each of these upwelling ons, and between the characteristic density distributions of each of these regions. *Subject dings:* **1. Boundary phenomena 2. Equatorial undercurrent 3. Upwelling 4. Coastal equatorial circulation 5. Pacific Ocean.**—*I.S.*

12M–908 551.553.21:551:465.46(266,267) 551.501.5:551.464:551.52

Wyrtki, Klaus (*Inst. Marine Res. Djakarata, Indonesia*), **The water exchange between t**
Pacific and the Indian Oceans in relation to upwelling processes. *Pacific Science Congre*
9th, Bangkok, 1957, Proceedings, Vol. 16, pub. **1958.** 61–66. 3 figs., 3 refs. **DWB** (M(0
P117p)—Hydrographic survey data collected in the Banda and Arafura Seas were available fr
the Snellus Expedition 1929 and the research vessel "Samudera's" investigations in 1957. Te
perature-salinity distribution data provided the basis for water mass analysis in this study.
tracing water masses it was found that during the southeast monsoon, the Monsoon Curre
flowing into the Flores Sea and the Timor Current flowing into the Indian Ocean are suppli
by water of the Banda and Arafura Seas. Because the inflow of surface water from the Paci
Ocean is not sufficient to balance the outflow, upwelling takes place. The upwelling water
replaced within the discontinuity layer by an inflow of the Subtropical Low Water from the Paci
Ocean. During the northwest monsoon, the Monsoon Current coming from the Flores Sea spl
off in the Banda Sea, one branch flowing into the Pacific Ocean, another passing over into t
Timor Current, which is only weakly developed during this season. But the Monsoon Curre
is stronger than the outflow at the surface from the Banda Sea, and sinking of water mass
occurs in the Banda and Arafura Seas. The sinking water is balanced in the depths by an o
flow of Banda Sea water into the Indian Ocean in the 1000 m level. Below the surface layer the
is always a flow from the Pacific to the Indian Ocean, but it takes place in different layers duri
each monsoon season. The seasonal variations in the hydrographic conditions are represented
illustrations. Maps showing transport directions in the surface layers in Feb. and Aug., a te
perature-salinity diagram, and a schematic diagram showing the direction of the flow of t
different water masses in the water exchange between the Pacific and the Indian Oceans
included. *Subject Headings:* **1. Water masses 2. Upwelling 3. Temperature-salinity d**
grams 4. Banda Sea 5. Arafura Sea 6. Pacific Ocean 7. Indian Ocean.—*E.Z.S.*

SEICHES

12M–909 551.466.66:532.594:551.4

Arons, A. B. and Stommel, Henry, **A β-plane analysis of free periods of the second cl**
in meridional and zonal oceans. *Deep-Sea Research,* London, 4(1):23–31, Dec. **1956.** 2 fi
3 tables, 3 refs., 35 eqs. **DLC**—Quasi-geostrophic free oscillations (or barotropic seiches)
meridional and zonal oceans are analyzed for plane oceans of uniform depth and non-unifo
rotation (the approximation of the β-plane). These motions have been denoted "motions of
second class" by tidal theorists. An attempt is made to clarify the physical nature of such oscil
tions and to calculate periods and wave-lengths which give an idea of the orders of magnitu
which are involved. *Subject Headings:* **1. Ocean wave motion 2. Barotropic seiches.**—*Autho*
abstract.

12M–910 551.466.66:532.5

Polli, Silvio, **Le sesse nei porti di Livorno e Imperia.** [Seiches at the ports of Livo
and Imperia.] *Geofisica e Meteorologia,* Genoa, 3(4/5):99–102, July/Oct. **1955.** 7 figs., 2 tab
bibliog. p. 102. **DWB**—An analysis is presented of the seiches recorded on the mareogra
obtained at Livorno and Imperia. It includes their period, mean amplitude, the generating ba
and the possible causes giving rise to them. Tables giving the observed period, maximum a
plitude, mean duration and calculated periods and nomograms are given. *Subject Headin*
1. Seiches 2. Livorno, Italy 3. Imperia, Italy.—*I.L.D.*

12M–911 551.466.66:532.594:551.

Sugawara, N., **On the free oscillation of sea water at Kushiro Harbor.** *Journal of M*
orological Research, Tokyo, 5(1):63–66, March 1953. 4 figs., 3 tables. In Japanese; Eng
summary p. 63. **MH-BH**—Seiches observed in Kushiro harbor are compared with wind direct
data and found to be strongest when combined with NW wind. Observed seiche periods ag
with calculated values. *Subject Headings:* **1. Seiches 2. Wind effects on seiches 3. Kush**
Harbor, Japan.—*G.T.*

12M–912 551.466.66:532.

Whittle, P. (*Appl. Math. Lab., New Zealand*), **The statistical analysis of a seiche rec**
Journal of Marine Research, 13(1):76–100, Oct. **1954.** 12 figs., 2 + tables, 17 refs., 19
DWB—The series analyzed consists of 660, 15-sec observations of the water level in a
channel on the Wellington coast. Both correlogram and periodogram were employed in an atte
to isolate possible discrete components of the spectrum and to characterize the continuous c
ponent. Several trains of waves were found, some with phase and amplitude so remarkably st
that they could not be distinguished from sustained oscillations. The two main sets of waves v

tified as being due to reflection at the open end of the channel and at the coast of an island
allel with the channel but some 15 chains outside it. The periods of the remaining waves (with
exception) appear to bear a simple numerical relation to the periods of these main trains,
it is suggested that the existence of these minor trains and the surprising permanence of one
n train are due to a nonlinear phenomenon associated with the intermittent washing in of
er at the top (shore) end of the channel. This mechanism is examined. (The reader is
erred to the sections on analysis and results for a summary of the purely statistical findings.)
ject Headings: **1. Seiches 2. Wellington Coast, New Zealand.**—*Author's abstract.*

TSUNAMIS

12M–913 551.466.62:532.593:550.34
Coast and Geodetic tsunami warning system. *Mariners Weather Log,* Wash., D. C., 4(5):
–156, Sept. **1960.** **DWB, DLC**—A brief description is given of the tsunami warning system.
system includes five Coast and Geodetic Survey seismological stations, each equipped with
ble recorders and an alarm to alert the observer. The Honululu station is the nerve center
he system and controls its operation during an alert. Additional seismological data are fur-
ed by the Univ. of Calif., the U. S. Navy, the Huancayo Observatory, the Japanese Central
. Obs., the Manila Obs. and others. Sixteen tide stations are utilized to determine whether or
a wave has been generated by a particular earthquake. *Subject Headings:* **1. Tsunamis
'sunami travel time 3. Tsunami warning system.**—*E.Z.S.*

12M–914 551.466.62:532.593:550.34
Hirono, T. and Hisamoto, S. (*Central Met. Obs.*), **A method of drawing the wave fronts of
ami on a chart.** *Geophysical Magazine,* Tokyo, 23(4):399–406, May **1952.** 2 figs., 3
es. **DLC**—Various methods for depicting the propagation of wave fronts of tsunami by
ns of Huyghens's principle are described briefly. These methods include the use of Sansom's
ection for drawing the wave fronts (developed by the authors themselves) that of R. Taka-
hi, that of N. Miyake and that of the U. S. Coast and Geodetic Survey. A new method is
osed; it also employs Huyghens's principle but distortion is avoided by projecting the wave
ts upon a stereographic map. Its application to the Sanriku tsunami is illustrated. *Subject
dings:* **1. Tsunamis 2. Sanriku tsunami, Japan**—*I.L.D.*

12M–915 551.466.62:532.59:550.34
Honda, Hirokichi and Nakamura, Kôhei (*both, Geophysical Inst., Tôhoku Univ.*), **On the
ion of the surface of the sea due to a submarine earthquake.** *Tôhoku Univ. Science
orts, 5th series, Geophysics,* 7(1):17–34, Aug. 1955. 14 figs., 10 refs., numerous eqs. **DWB,
C**—Theory of the motion of the surface of the sea of uniform depth, due to the dilatational
distortional waves emitted from an impulsive point source within the elastic solid bottom, is
loped. The results are applicable for the region not very far from the epicenter. *Subject
dings:* **1. Earthquake waves 2. Submarine earthquakes effects 3. Tsunamis.**—*Authors'
ract.*

12M–916 551.466.62:532.593:550.34
Ichiye, Takashi (*Florida State Univ.*), **A theory on the generation of Tsunamis by an
ulse at the sea bottom.** *Oceanographical Society of Japan, Tokyo, Journal,* 14(2):41–44,
1958. fig., 5 refs., 9 eqs. **DWB**—A theory of tsunami generation by an impulse at the sea
om is proposed. The bottom is supposed to be suddenly elevated, and corresponding oscillation
he water to the surface and the propagation of tsunami waves in both directions are shown.
[Note by] Koji Hidaka, *Ibid.,* p. 45–46. Table, eqs. **DWB**—An evaluation of a com-
ted integral is made to furnish Ichiye with necessary material for his discussion of tsunami
ussion given in the preceding paper. *Subject Heading:* **Tsunami triggering mechanism.
idaka, Koji.**—*Author's abstract.*

12M–917 550.34(086):551.466.62
Karo, H. Arnold (*Coast & Geod. Surv., U. S. Dept. of Commerce*), **What we are doing
it seismic waves.** *Conference on Coastal Engineering, 6th, Univ. of Florida, Dec. 1957,
eedings,* pub. **1958.** p. 163–170. **DWB** (627 C748pr)—The work of the U. S. Coast and
letic Survey for the past 150 yrs is reviewed. The Survey attempts to maintain alerts and
ings. Its operational procedures are explained. *Subject Headings:* **1. Tsunami warning
em 2. Seismic sea waves.**—*E.Z.S.*

12M–918 551.466.62:551.462:532.593:550.341
Khovanova, R. I., **O fáze *T* i vosmozhnoĭ ee sviazi s tsunami.** [*T*-phase and its possible
ion to tsunamis.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.,* No. 10:1506–1509, Oct.

1959. 2 figs., 15 refs. Transl. into English in the corresponding number of the *Bulletin of* *Academy of Sciences, USSR, Geophysics Series.* **DLC**—The phenomenon "tsunami" is bri described as the result of an earthquake below the ocean bottom surface. Very rapid cha in the bottom relief creates intensive pressure waves passing into a sea wave (tsunami). Rece a new phase (*T*) was observed in the seismic wave, produced by under-sea earthquakes, and i given intensive study in the literature. The analysis and interpretation of this phase by ferent investigators, listed in 15 references are reviewd by th author with commnts illustrations. No definite conclusion could be stated for the relation of the phase (*T*) to "tsunami" before additional characteristics more definitely indicate this connection. *Sub* *Headings:* **1. Tsunamis 2. Earthquake wave phases 3. T-phase of earthquake waves.**—*N.I*

12M–919 551.466.62:532.593:550.3

Sviatlovskiĭ, A. E., **Tsunami: morskie volny pri zemletriaseniiakh.** [Tsunami: sea wa during earthquakes.] Moscow, Akademiia Nauk SSSR, **1955.** 21 p. 2 maps. tables. At h of title: Akademiia Nauk SSSR. Soviet po Seĭsmologii. **DLC** (GC221. S84)—A pamphlet tematically describing the causes of tsunamis and their nature, (height, speed, distance trave etc.) with special reference to those tectonically induced waves which originate in the Japan Kurile-Kamchatka-Aleutian volcanic arcs. Maps of the Pacific show general scheme of or and propagation, and scale of intensity of earthquakes. During the past 2.5 thousand y > 300 have occurred in the Pacific area compared with 26 in the Atlantic and 21 in the Medi ranean. Japan has had 82, Hawaii 38, South America (West coast) 54 and North America The waves have traveled 18,000 km in 23½ hours, with a speed of 750 km/hr. Rates vary f 430 to 810 km/hr and heights 5 m or more on shallow reefs. *Subject Headings:* **1. Tsunar** **2. Pacific Ocean.**—*M.R.*

12M–920 551.466.62:532.593:550.3

Sviatlovskiĭ, A. E., **Tsunami tikhookeanskogo poberezh'ia SSSR.** [Tsunami at the Pa coast of the U.S.S.R.] *Priroda,* Moscow, No. 4:93–97, April **1959.** 4 figs. **DLC**—Tsunam the Japanese name for unusually large waves suddenly appearing on the coast of the Pacific f its outskirts to the Hawaiian shores. These waves are produced by earthquakes originating the sea bottom; in rare cases they are produced by volcanic eruptions accompanied by vigo explosions and the precipitation of large masses of volcanic products into the ocean. The au discusses in great detail the origin and development of the phenomenon on the Pacific coas the U.S.S.R., the speed, size and strength of the waves and the damage produced in the co zones. Methods of seismic forecasting and warning of the imminent disaster used on the U.S. coast are described and discussed. *Subject Headings:* **1. Tsunamis 2. Tsunami warning** **Pacific Coast of U.S.S.R.**—*A.M.P.*

12M–921 551.466.62:550.341.5:532

Tomczak, Gerhard, **Tsunamis.** *Umschau,* Frankhurt, a.M., 56(15):466–469, Aug. 1 4 figs., 2 tables, 4 refs. **DLC**—Tsunamis are deep long-period waves due to movements of sea floor, with a period of 15–45 min, and wave length about 250 km. The wave spectru tabulated from surface waves (3–25 sec) up to tides (12–25 hr). In the open ocean the s of tsunamis is 700–800 km/hr and height 30–60 cm, but near the coast they slow down t km/hr and may rise suddenly to 30 m or more. Photos of damage are given. They occu almost all coasts, but most often on Japan and Hawaii. The American warning service b on seismometry is described, but in Japan earthquakes are often too near. *Subject Headi* **1. Tsunamis 2. Tsunamis warning 3. Pacific Ocean.**—*C.E.P.B.*

12M–922 551.466.62:532.593:550.34(

Tsunami strikes Pacific Ocean basin. *Mariners Weather Log,* Wash., D. C., 4(5): Sept. **1960.** photo. **DWB, DLC**—An explanation of the source and nature of the seismic waves which struck the Hawaiian Islands and other areas of the Pacific Ocean on May 2 1960. The waves were started by movements of the ocean floor off the Coast of Chile on 23, 1960. The seismic sea wave warming system developed by the Coast and Geodetic Su gave warning of the possibility of disastrous waves many hours before they reached the Haw Islands. Estimates of the damage incurred around the Pacific are given. *Subject Headi* **1. Tsunamis 2. Earthquake Chile, (May 23, 1960) 3. Hawaii 4. Japan 5. Chile.**—*E*

12M–923 551.466.62:532.593:5

van Dorn, William G. (*Scripps Inst. Oceanog., La Jolla*), **Research on Tsunamis.** *I* *national Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* I Wash., D. C., AAAS, **1959.** p. 785–786. French summary p. 786. **DWB** (551.46082 I61 description of some of the techniques employed to obtain information on long waves and the sults obtained, especially those for Tsunamis, in connection with the research program of the ripps Inst. of Oceanog. The observations were carried out for about two years at each of three all, isolated Pacific islands, using a special recorder developed at the Scripps Institution. *Sub-t Headings:* **1. Long waves 2. Tsunamis 3. Pacific Islands.**—*I.S.*

12M–924 550.341.6:551.466.62

Watanabe, H., **Quantitative investigation of Tsunami (A study of tsunami in the Sanriku ast, Pt. 2).** *Journal of Meteorological Research*, Tokyo, 7(9):565–573, Oct. **1955.** 7 figs., ables, 10 refs., 10 eqs. In Japanese; English summary p. 565. **DWB, DLC**—Also issued as: *ndai, Japan. Central Meteorological Observatory, Bulletin of the Meteorological Society Re-rch of Tohoku District*, 9(1):43–51, Nov. **1955.** In Japanese; English summary p. 43.—me quantitative investigations of tsunami on the Sanriku coast, the Pacific coast of Northern pan, are described. The author shows that the height of tsunami at its origin can be estimated m the study of the mareograms, corresponding to the four great earthquakes which occurred the coastal regions of northern Japan. The author has computed their energy and defined the gnitude of tsunami by the height of tsunami at the origin. The energy of tsunami thus com-ted is smaller than traditional ones, but is of the same order of magnitude as that already culated. *Subject Headings:* **1. Tsunamis 2. Sanriku Coast, Japan.**—*Author's abstract.*

12M–925 551.466.62:532.593:531.51

Wiegel, R. L. (*Dept. of Engr., Univ. of Calif.*), **Laboratory studies of gravity waves gen-ted by the movement of a submerged body.** *American Geophysical Union, Transactions*, (5):759–774, Oct. **1955.** 9 figs., 7 tables, 9 refs. **DWB, DLC**—In order to gain some insight o the phenomenon of gravity waves generated by underwater seismic disturbances, the tsunami, aboratory study was made of the waves resulting from an idealized two-dimensional model of movement of a submerged body. Bodies of several shapes, sizes and weights were allowed drop vertically or to slide down inclines of several angles, in water of various depths from eral heights above the bottom but always below the water surface. The surface time histories re recorded at a point close to the origin of the disturbance, and at a point or points some tance from the origin. In addition, motion pictures were taken of several of the tests. It was nd that a crest always formed first, followed by a trough from one to three times the amplitude the first crest (depending primarily upon the slope of the incline), followed by a crest with out the same amplitude as the trough. Because of the dispersive qualities of the waves, litional crests and troughs continued to form with increasing distance from the origin. The gnitude of the amplitudes depended primarily upon the submerged weight of the body, but o upon the depth of submergence, the water depth, and other characteristics of the generation. thin the limits of experimental conditions, it was found that the time intervals between the first l second crests remained constant regardless of the water depth, the distance of fall, the ight of the body or the time of the fall. It was, however, found to be related to the length of body with the period increasing with increasing length and to the slope of the incline with smaller the incline the greater the period. *Subject Headings:* **1. Gravity waves 2. Tsunamis.** *Author's abstract.*

12M–927 551.466.62:532.593:550.34

Yoshida, Kozo (*Geophys. Inst. Tokyo Univ., Japan*), **A statistical approach to some prob-ns concerning the energy transmission of Tsunami waves.** *International Oceanographic ngress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** 790–792. German summary p. 791–792. **DWB** (551.46082 I61pr)—Certain useful data on energy transmission of Tsunami waves can be obtained from tide gage records, especially ut the nature of relationship between the wave envelop form and the travel time. R. TAKABASI's lysis of a few cases of large tsunamis is cited which show quantitatively that the delay time a linear function increasing with the travel time. Dispersion of tsunami waves traveling over ances of the ocean with an irregular bottom is discussed. *Subject Headings:* **1. Tsunami rgy transmission 2. Tsunami travel time.**—*I.S.*

12M–928 551.466.62:532.593:550.34

*Zerbe, W. B. (*Chief, Section of Oceanog., Div. of Tides & Currents, Coast & Geodetic Sur-*), **The tsunami of Nov. 4, 1952 as recorded at tide stations.** *U. S. Coast and Geodetic rvey, Special Publication;* No. 300, **1953.** 62 p. map, 7 tables, numerous charts, 9 refs. **DWB** 5.6 Z58t)—This paper contains the "factual record of the Nov. 4, 1952 tsunami as shown by gage records and other data on file at the U. S. Coast and Geodetic Survey." The discussion udes the following: the tsunami record (given in a table), comparison with the April 1, 1946

tsunami, speed of waves, wave period and wave length, duration of the oscillations, reports
observers, the seismic data warning system and list of cases 1946–1952. The gage records
the various stations are reproduced. *Subject Headings:* **1. Tsunamis 2. Tide gage records.**
I.L.D.

MICROSEISMS

12M–929 550.342:532.5

Bossolosco, Mario; Cavo, A. and Dagnino, I., **Sulla genesi dei microsismi.** [Genesis
microseisms.] *Geofisica Pura e Applicata,* Rome, 38:45–56, **1957.** fig., table, 10 refs. Itali
and English summaries, p. 45. **DLC**—The seismic and sea-wave recordings carried out in Gen
during March 1st 1953 and May 31st 1954 have proved, that nearly always a great agitation
the sea provokes a corresponding great microseismic activity. The analyses of the other mo
numerous cases of microseisms have demonstrated that they are all generated by the direct acti
of the wind on the ground surface; as a consequence of the wind-turbulence, action being pa
ticularly marked on the sides of mountains. Further it is also demonstrated that the Alps a
the Appennines around Genoa are acting as a microseismic barrier. *Subject Headings:* **1. Orig
of microseisms 2. Genoa, Italy.**—*Author's abstract.*

12M–930 550.342:551.465:532.

Eppley, Robert A. (*U. S. Coast & Geodetic Survey*), **A review of microseisms and th
relation to ocean waves.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints
abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 747–750. In English and Germa
DWB (551.46082 I61pr)—A review of the work done as part of the United States Navy Mic
seism Project supports the "wave interference" theory of microseismic generation set forth
LONGUET-HIGGINS. A comparison of microseismic amplitude and period at certain stations w
data from wave gages situated near that station showed a high degree of correlation betwe
microseisms and swell. It is concluded that the major microseismic generating mechanism at coas
and island stations is associated with the interference of swells near the stations. *Subject He
ing:* **1. Microseisms and swell.**—*I.S.*

12M–931 550.342:532

Strobach, Klaus (*Observ. Geophy. Inst. Univ. Hamburg*), **Zum Studium der mikroseisn
schen Bodenunruhe in Hamburg.** [Study of microseismic disturbances at Hamburg.] *Ze
scrift für Geophysik,* Würzburg, 21(4/5):190–214, **1955.** 20 figs., 14 refs., 8 eqs. German a
English summaries, p. 190. **DLC** (QC801.Z4)—A special method is given to investigate
microseismic disturbances in view of the fact, that microseismic motion is of statistical appe
ance, but caused by a series of physical occurrances. An attempt is made to develop a statisti
theory of superposed oscillations caused by waves traveling from different directions and w
varying amplitudes. In this way it is shown, that the problems of the character of waves and th
directions of approach can be studied by means of a statistical investigation of the horizontal dir
tions of oscillations. A vector seismograph is described, by means of which the horizontal mo
ments of particles (Lissajous figures) are recorded. The method of treating the records is ch
acterized by forming the sums of amplitudes corresponding to the horizontal directions of grou
oscillations. Comparisons of some results with the weather conditions show that the grou
particles are chiefly moving parallel to the direction of approach of waves. A noticeable rate
Love waves had not been observed until the investigation. *Subject Headings:* **1. Microseis
2. Germany**—*Author's abstract.*

REGIONAL STUDIES

See: **Geographic Index for complete listing.**

PACIFIC OCEAN

See also: **Surface water temp. western North Pacific** (Takenouti et al.), 12M–758.

12M–932 551.465.5(265/2

Hidaka, Koji, **A theoretical study on the general circulation of the Pacific Oce**
Tokyo. Univ. Geophysical Institute, Geophysical Notes, 8(1), Contribution No. 10, June 1
5 figs. (1 fold.), 14 tables, 15 refs., 89 eqs. **DLC.** Reprinted from: *Pacific Science,* Honol
9:183–220, April **1955.**—In addition to investigating the wind direction, the author treated

al circulation of the water in a square ocean comparable in size to the Pacific basin with a nic equation of the stationary ocean currents. An explanation is given of computation of urrents, surface circulation and vertical structure of the wind driven circulation. It is uded that Pacific Ocean is considered to be a rectangular ocean extending from 60°S to 60°N des and from 0° to 120° longitude; the patterns of horizontal circulation are obtained in of streamlines for the sea surface and several deeper layers specified by the ratio z/Dz z is the geometrical depth below the surface and Dz the depth of the frictional influence; he current velocity does not drop as low as half the surface value even at a level $3Dz$ that ow 225 m. *Subject Headings:* 1. **Oceanic circulation** 2. **Pacific Ocean.**—*K.C.*

2M–933 551.513:551.465.5(266)(08)

saacs, John D. and Sette, Oscar E., **Unusual conditions in the Pacific.** *Science,* Wash., ., 129(3351):787–788, March 20, **1959. DLC.** Reprinted as *California. Univ. Scripps ution of Oceanography. Contributions,* 1959, issued **1960.** p. 9. **DWB** (551.46 C153co)—ief report on the symposium held at Rancho Santa Fe, California, 2–4 June 1958 at the tion of the Scripps Institution of Oceanography to consider the nature and causes of the ual meteorological and oceanographic conditions in the Pacific during 1957 and early 1958. roceedings of the symposium are published elsewhere. Data considered were the Northern sphere circulation in the atmosphere, sea temp., sea level and currents of the Pacific, and the bution of marine organisms. The symposium also heard a report on the unusual solar events 57 and the possible relations to the unusual meteorology was discussed. It was suggested that nusual conditions in the Pacific were the evidence of large-scale advection of water masses, hat the theory and the data so far analyzed are inadequate to distinguish the processes by the advection took place. *Subject Headings:* 1. **Atmospheric circulation** 2. **Oceanic lation** 3. **Marine ecology** 4. **Oceanography symposia** 5. **Pacific Ocean.**—*E.Z.S.*

2M–934 551.462:551.465.5:550.9:539.16:546.26(265/266)

Suess, H. E.; Rakestraw, N. W. and Oeschger, Hans (*all, La Jolla, Calif. Scripps Inst.*), **rent age of deep water in the Pacific Ocean.** *International Oceanographic Congress, 1st, ., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 440–441. nglish and German. **DWB** (551.46082 I61pr)—Deep water samples were collected on the Expedition "Downwind" on a N-S line from about 150°N to 47°S. These samples were for Carbon^{14} measurements to determine apparent age. "Ages" thus determined are listed. esults show the slightly younger age for deep water in the eastern basin of the South Pacific, mpared with that in the western basin. They also show in the longitudinal section of the c from S to N a regularly increasing age of the deep water from approximately 1300 to years. *Subject Headings:* 1. **Deep water age determination** 2. **Expedition Downwind cific Ocean.**—*I.S.*

2M–935 551.465.5:551.5(266)

Gierloff-Emden, Hans-Günter (*Hamburg*), **Der Humboldtstrom und die pazifischen Land- ten seines Wirkungsbereiches.** [The Humboldt current and the Pacific regions in its e of influence.] *Petermanns Geographische Mitteilungen,* Gotha, 103(1):1–17, **1959.** 11 plates 3–4 in pocket, (1–2 lacking), 118 refs. Spanish and German resumes, p. 1–2. **DLC** is comprehensive study of the Humboldt current is based upon an extensive review of the ture and includes a detailed discussion of the following, viz: History of the discovery aming of the current, its origin, course and oceanographic characteristics, including tem- ure, distribution, disturbances, etc.; the biological and geographical effects of the Humboldt nt, the geographic boundary of the Pacific coastal landscape influenced by the current, a iption of the coasts, rivers, climate, vegetation and dunes, the extent of the influence of the nt in the interior of Chile and upon the Galapagos Islands. *Subject Headings:* 1. **Ocean nts** 2. **Humboldt current** 3. **Ocean current effects on climate** 4. **Chile** 5. **Galapagos ds** 6. **Pacific Ocean.**—*I.L.D.*

2M–936 551.46:92 551.465.5

Nieto, Manuel R., **Humboldt y la Corriente del Perú.** [Humboldt and the Peruvian Cur- *Sociedad Geográfica de Lima,* Boletín, 76:15–39, **1959.** table, 123 refs. **DLC**—A brief ence to the life and work of Humboldt, precedes a discussion of the characteristics of the vian Current. Various oceanographic expeditions which studies this current are mentioned. dition, important publications reporting on the properties of the current are cited. *Subject ings:* 1. **Peruvian Current** 2. **Humboldt, Alexander von.**—*E.Z.S.*

12M–937 551.513.1:551.465.5:551.

von Arx, William S., **Circulation systems of Bikini and Rongelap Lagoons.** *U. S.*
logical Survey, Professional Paper 260-B (i.e., Ch. 8 of Pt. 2 of its **Bikini and nearby at**
1954. p. 265–273. figs. 85–90, 5 tables, 7 refs. **DGS, DWB** (M(055) U582pr)—Four
one-half months early in 1946 were spent in the field at Bikini and Rongelap Atolls to stud
circulation systems within the lagoons. Later, in the laboratory, synoptic studies were ma
kinematically similar models based on early field data. The results of these studies were
tested against further observations made in the field. It was found that both lagoons exh
a primary circulation (overturning wind-driven circulation) and a secondary circulation (r
circulation composed of two counter-rotating compartments). The direction of the primar
culation and the division between the counter-rotating compartments of the secondary circu
were always contained in a vertical plane having roughly the azimuth of the prevailing
The vigor of both circulations varied with the average wind strength taken over the previo
hrs. Perturbations of the primary and secondary modes of circulation were produced by
and waves and by the North Equatorial Current, which surrounds the atolls of the nor
Marshall Islands group. Seasonal changes also were noted: the circulation of the winter m
when the northeast trade winds prevail, showed a marked stability and strength which was
ing in the summer season, when the atolls are on the edge of the belt of doldrums. In ad
to the qualitative synopsis of the circulations, numerical data are presented in tabular form
show the volumetric exchanges of water between the lagoons and the ocean. An estimate is
of the rates of refreshment and overturning of each lagoon. A chart of the values of hori
diffusion in the surface plane is given for Bikini Atoll. *Subject Headings:* **1. Lagoona**
culation 2. Bikini Atoll 3. Rongelap Atoll 4. Marshall Islands.—*Author's abstract.*

12M–938 551.556.8:551.465.5

Hidaka, Koji and Nagata, Yutaka (*both, Geophys. Inst., The Univ., Tokyo*), **Dyna**
computation of the equatorial current system of the Pacific, with special application t
equatorial undercurrent. *Geophysical Journal,* London, 1(3):198–207, Sept. **1958.** 5
2 tables, 12 refs., 13 eqs. Reprinted as *Tokyo, Univ. Geophysical Institute, Geophysical*
12(1), Contribution No. 9, **1959. DWB, DLC**—The currents near the equator are treat
solving the dynamical equations for the steady-state involving terms of Coriolis force, pr
gradient, and horizontal and vertical mixing. The coefficients of horizontal and vertical
are estimated at 10^8 and 10^2 c.g.s., respectively, and are constant everywhere. The distri
of mean wind-stress and mean pressure are computed from observed data. The result sho
eastward current below the surface near the equator, and it seems to give an explanation
equatorial undercurrent. *Subject Headings:* **1. Ocean currents 2. Equatorial current s**
3. Pacific Ocean.—*Authors' abstract.*

12M–939 551.465.5(26

Knauss, John A. (*Univ. of Calif.*), **The equatorial countercurrent as shown by the**
pac observations. *Pacific Science Congress, 9th, Bangkok, 1957, Proceedings,* Vol. 16,
1958. p. 228–232. 7 figs., 7 refs. **DWB** (M(06) P117p)—A consideration of the resu
observations made by Equapac and the data compiled from previous United States Navy
graphic Office surveys. The conclusions that can be drawn from the preliminary analysis
Equapac data are that the Equatorial Countercurrent is well developed between 130° and
and 160° and 175°W. It is less well developed and apparently split between 155° and
It is not certain whether the countercurrent was continuous from 130°E and 130°W during
1956. However, there is nothing in the Equapac data contrary to the hypothesis arrived
examining the United States Navy Hydrographic Office current set charts; that the Equ
Countercurrent is composed of an eastern and western section; that the junction point of t
sections is at the approximate longitude of the Marshall Islands; and that the sections
meet in winter, but may be continuous in summer. Mean temperature charts (Marshall
area), a typical BT section across the Equatorial current system, pertinent charts taken
United States Navy Hydrographic Office, Atlas of Surface Currents and a preliminary
the Equatorial Countercurrent for August–September 1956 as interpreted from the Equapa
are included. *Subject Headings:* **1. Equatorial Countercurrent 2. Equapac observatio**
Equatorial Pacific Ocean.—*E.Z.S.*

12M–940 551.465.

Knauss, John A. and Pepin, Robert (*both, Scripps Inst. of Oceanog., La Jolla, Calif.*),
urements of the Pacific equatorial countercurrent. *American Geophysical Union, Transa*
40(1):78–79, March 1959. fig. **DWB.** Also in *Nature,* London, 183(4658):380, F
1959. fig., table, 3 refs. **DLC**—The highest velocities in the Pacific Equatorial Counter

in the top 150 m, and peak velocity is found at about 100 m. The countercurrent does not ı beneath the thermocline, but continues east at approximately 8–11 miles per day, and 's to 250–300 km transporting roughly 50% more water below the thermocline than above it. ıew calculations approximately triple previous estimates of the total volume of water trans-l eastward in the Equatorial Pacific. *Subject Headings:* **1. Pacific equatorial counter-nt.**—*E.Z.S.*

2M–941 551.465.5(265)

nauss, John A. (*Scripps Inst. Oceanog., La Jolla, Calif.*), **Direct current measurements : equator: the Cromwell Current.** *International Oceanographic Congress, 1st, N. Y., 1959, ints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 515–517. fig. German ary p. 517. **DWB** (551.46082 I61pr)—This is a brief description of direct current meas-nts made during the IGY along the equator in the central and eastern tropical Pacific. The d of measurement is described. The measurements show that the subsurface eastward flow, escribed in 1954, is a major current. The current identified as the Cromwell Current extends at least 92°W to 150°W, although indirect evidence suggests a much longer length. *Subject ngs:* **1. Equatorial current measurements 2. IGY oceanographic program 3. Crom-urrent 4. Pacific Ocean.**—*I.S.*

2M–942 551.465.5(265/266)

l, Joseph L., Jr. (*Scripps Inst. of Oceanog., Univ. Calif.*), **Evidence of a south equatorial ercurrent in the Pacific Ocean.** *Nature,* London, 184(4681), Supp. No. 4:209–210, July 59. 8 refs. **DWB**—The eastward flowing current is indicated along a density surface in acific Ocean south of the equator. The current is found between lat. 2°S and 5°S at long. and progressively farther south toward the east, to between lat. 10°S and 14°S at long. The calculations of geostrophic flow along this surface with respect to 1000 decibars h the necessary evidence. The eastward geostrophic flow is indicated on ten cross sections by the Equapac expeditions in late summer of 1956, on three sections made by the Carnegie of 1929–30 and by numerous other stations. *Subject Headings:* **1. South equatorial coun-rent 2. Ocean currents 3. Pacific Ocean.**—*I.S.*

2M–943 551.465.5:551.463/4:593.14(266)

ishizawa, Satoshi; Inoue, Naoichi and Akiba, Yoshio (*all, Hokkaido Univ.*), **Turbidity oution in the subarctic water of the North Pacific in the summer of 1957.** *Records eanographic Works in Japan,* Tokyo, n.s., Spec. No. 3, issued **1959.** p. 231–241. 10 figs., s.—A detailed explanation of the turbidity meter and its measuring circuit is given. The ns of stations occupied during the observation cruise from Aug. 23 to Sept. 13, 1957 are . Turbidity observations were carried out along the line of 44°N. Vertical distributions bidity and temperature at several stations are shown. The whole section of turbidity is ated in figures which indicate temperature and chlorinity distributions. Generally the ty contrast in oceanic water is smaller than in coastal water and the striking middepth of turbidity observed on the continental shelf and at the edge of it is rarely observed in water. The authors also discussed the relation of vertical turbidity distribution to the tion of phyto-plankton population in a shallow homogeneous water mass. They sometimes that the vertical gradient of turbidity changes with depth almost parallel with the estimated plankton production. And a remarkable maximum of turbidity is found at the thermocline. oted that high values of turbidity are found in the regions where stability of stratification high, the very turbid surface water at a certain station is especially low in chlorine and ermocline is at about 25 m depth. The turbidity value is considered to depend mainly on plankton and organic detritus which is also of planktonic origin. *Subject Headings:* **1. ater turbidity 2. Phyto-plankton productivity 3. North Pacific**—*K.C.*

M–944 551.465.5(265.4)

giura, J. (*Hakodate Marine Observatory*), **On the sea conditions east of the Kurile s.** *Oceanographical Magazine,* Tokyo, 10(2):169–178, Dec. **1958.** 6 figs., 3 tables, 4 **DWB, DLC**—The character of the Oyashio Current and its pattern is presented. Discus-f the distribution of the North Pacific Subarctic Water on the basis of the data obtained ships in the period of 1933–1936. Sea conditions east of the S–N Kurile Islands and atka, such as computations of velocity and volume transport, and their relations to the o current are shown in figures and in tables. Technical observations of the cyclonic-lonic cold eddy, water masses, and seasonal variations were made. *Subject Headings:* **rent patterns 2. Oyashio Current 3. Water masses 4. North Pacific Ocean.**—*K.C.*

12M–945 551.526.64:551.4

Ottosen, Peter H., **The Vitiaz in the Okhotsk Sea.** *Navigation,* Los Angeles, 5(5):2
230, Spring **1957.** 4 figs., 3 refs. **DWB, DLC**—Oceanographic data obtained by ADM
MAKAROV are summarized and discussed. Oceanographic stations maintained by the vesse
this area are mapped. The temperature-depth and density-depth structures of the cold cur
passing east of Kamchatka are illustrated together with similar relationships within the Okh
Sea. A modern temp.-salinity plot is given for several stations in the Sea. *Subject Headi*
1. Oceanographic data 2. Kamchatka 3. Okhotsk Sea.—*N.N.*

12M–946 91.04(265) 551.465.5

Burkov, V. A., **K gidrologii Komchatskogo raĭona Tikhogo okeana v vesennee vre**
[Hydrology of the Commander-Kamchatka region of the Pacific Ocean in spring.] *Akade*
Nauk SSSR. Institut Okeanologii, Trudy, 27:12–21, **1958.** 8 figs. **DWB**—Describes the
plex investigation carried out by s/s "Vitiaz" at the end of May and beginning of June 195
the northwestern part of the Pacific Ocean. The area of investigation is delineated. The
obtained in the investigation are described and discussed. Changes in salinity and temperature
analyzed as well as water circulation is observed and recorded. Analyses and discussions
illustrated with schematic charts of the area and graphs of temperature distribution with de
Subject Headings: **1. Hydrologic studies 2. Northwest Pacific Ocean.**—*B.J.G.*

12M–947 551.464/5:551.465.5(

Fukai, Rinnosuke (*Tokai Regional Fisheries Res. Lab., Tokyo, Japan*), **On the deep circ**
tion in the north-western North Pacific with reference to vertical distribution of disso
oxygen. (In: UNESCO Symposium on Physical Oceanography, Tokyo, Oct. 1955, **Proceedi**
pub. **1957.** p. 149–152. 6 figs., 2 refs. French summary, p. 149.) **DWB**—A report on
southward changes in vertical distribution of dissolved oxygen and phosphate taking the
circulation and the biological factors into consideration. *Subject Headings:* **1. Deep ocean**
culation 2. Dissolved oxygen in sea water 3. Phosphate in sea water 4. Northwes
Pacific Ocean.—*E.Z.S.*

12M–948 551.465.5(

Dobrovol'skiĭ, A. D., **Vazhneĭshie problemy fizicheskoĭ okeanologii severo-zapadnoĭ c**
Tikhogo okeana. [Most important problems of physical oceanography of the northwestern
of the Pacific Ocean.] *Akademiia Nauk SSSR. Okeanograficheskaia Komissiia, Trudy,* 3:24
1958. DLC (GC1.A47A2)—A brief note which points out the most important problems of phy
oceanography: The problem of explaining the structure of horizontal currents, explaining
seasonal changes of currents and their relation to synoptic conditions. It is important to ex
the formation and interaction of cold and warm water masses and the frontal region; and
the mode of origin of deep and bottom water. *Subject Heading:* **1. Physical oceanogra**
problems 2. Northwestern Pacific Ocean.—*E.Z.S.*

12M–949 551.464:551.465.5(265/

Bruevich, S. V., **On certain chemical features of waters and sediments in North-**
Pacific. (In UNESCO Symposium on Physical Oceanography, Tokyo, Oct. 1955, **Proceed**
pub. **1957.** p. 277–292. 7 figs., 4 tables, 14 refs. French summary, p. 257.) **DWB**—On
basis of detailed studies of the chemistry of water and specifically the analysis of the T-S c
and the tables of the vertical distribution of the hydrological and hydrochemical character
the author defines four basic types of vertical structure of water: the Subarctic Bering Sea
(Oiya-Shio), the Subarctic Pacific Ocean-Water, the Subtropical Kuro-Shio, and the "A
Tropical" type. Principal attention of the Dept. of Chemistry was concentrated upon inves
tion of the properties of the natural water content of bottom sediments but the investigations
also of a geological or geochemical nature. It is found that the upper layer of the open n
western part are separated into a grey terrigenous mud near shore and brown oxidized sedi
east of the grey sediments. Biological elements and conditions are also considered in their che
relationship within the sediments. *Subject Headings:* **1. Oceanographic chemistry 2. W**
masses 3. Marine sediments 4. Northwestern Pacific Ocean.—*E.Z.S.*

12M–950 551.465.5:551.464(265) 551.5

Uda, M. (*Tokyo Univ. of Fisheries*), **On the abyssal circulation in the Northwest Pa**
area. *Geophysical Magazine,* Tokyo, 28(3):411–416, March **1958.** fig., 2 tables, 7 refs.
—The author states briefly some details of studies in the North-Western Pacific (north t
Subarctic Convergence) especially on the basis of surveys carried out by expeditions and res
vessels below 1000 m depth, including the data obtained by Project NORPAC (1955). T

e presented giving data on temperature in °C, salinity and dissolved oxygen for various depths, nging from 0 to 2928 m in the Japan Sea, to 60 m in the Yellow Sea, to 1441 in the East iina Sea, to 1427 m in the South China Sea, to 2893 m in the Okhotsk Sea; and data on tem- rature and salinity only to 1989 m in the Bering Sea, to 1428 m in the Aleutian and to 5000 m pth in the N. Pacific. Each of these series of measurements was made at a different date roughout the year. Stratification of water masses in winter and summer in the different seas; e formation of dichothermal stratification in summer to about 200 m depth; and the existence a mesothermal layer in the Subarctic area in the depths 300–600 m are briefly treated. *Sub- ct Headings:* **1. Abyssal circulation 2. Water mass stratification 3. Project NORPAC Northwest Pacific.**—*A.V.*

12M–951 551.465.5(265)

Zenkevich, L. A., **Oceanographic research conducted by the USSR in the North-West acific.** (In: UNESCO Symposium on Physical Oceanography, Tokyo, Oct. 1955, **Proceedings,** **ab. 1957.** p. 251–252. French summary p. 251.) **DWB**—The study of the Far-Eastern Seas d of the adjacent parts of the Pacific Ocean is conducted by the Institute of Oceanology (Acad. Sciences), by the Pacific Inst. of Fisheries and Oceanography, and by the Far-Eastern Inst. r Hydrometeorology, and also by the Hydrographic Administration. The Vessel "Vitiaz" has ade 21 long-range research voyages. Thirteen volumes of the transactions hold the information llected by the Institute of Oceanology and its vessel. Each of the institutes publishes its own ports. *Subject Headings:* **1. Oceanographic research organizations 2. Soviet oceanographic stitutions 3. Northwest Pacific Ocean.**—*E.Z.S.*

12M–952 551.463/4:551.465.5(794)

California. State Water Pollution Control Board, **Oceanographic survey of the continental elf area of Southern California.** Its *Publication* No. 20, **1959.** 560 p. figs., tables, refs. roughout. Two pertinent articles abstracted separately: Stevenson, Robert E., **Marine climate Southern California,** p. 1–58. Tibby, R. B. and Terry, R. D., **Physical and chemical char- teristics of the water over the Southern California Shelf, 1956–1958,** p. 111–168. **DWB** 51.46 C153co)—This survey of the climate and oceanographic characteristics of southern Cali- rnia covers the investigations of the University of Southern California during the years 1943 rough 1957. It not only discusses the above characteristics but also the meteorological factors ch as the wind systems and cloud set up over the mainland shelf and the interactions of land d sea breezes as well as water movements. *Subject Headings:* **1. Marine climate of Southern alifornia 2. Chemistry of sea water 3. Physics of sea water 4. Southern California con- ental shelf.**—*N.N.*

12M–953 551.506.5:551.465.5(266)

*Callaway, Richard J. (*Pacific Oceanic Fishery Investigations, Honolulu*), **Oceanographic and eteorological observations in the Northeast and Central North Pacific, July–December 1956.** *S. Fish and Wildlife Service, Special Scientific Report—Fisheries* No. 230, Aug. **1957.** 49 p. figs., 10 tables, 7 refs. **DWB** (639.206 U583sp)—Meteorological, ocean temperature, salinity, osphate, light penetration and water color, and observations made during 3 fishing cruises in e Northeast and Central North Pacific on board the research vessels "John R. Manning" and Charles H. Gilbert," in July–December 1956, are tabulated and discussed. Maps show tracks cruises, and data are given in cross sections and tables. Wind, air temperature, wet bulb tem- rature, barometer, weather, cloud type and amount, visibility, sea swell and surf are tabulated. *ubject Headings:* **1. Oceanographic cruise data 2. Meteorological data 3. "Manning" and Gilbert" Cruises, 1956. 4. North Pacific.**—*M.R.*

12M–954 551.465.5:551.462

Edinger, James G., **Changes in the depth of the marine layer over the Los Angeles basin.** *urnal of Meteorology,* Boston, 16(3):219–226, June **1959.** 8 figs., 2 refs. **DWB, DLC**— erometeorograph soundings made at seven locations over the Los Angeles coastal plain and jacent valleys during the summer of 1957 are analyzed to provide the hourly daytime variations the depth of the marine layer as a function of geographical location. The factors influencing e depth of the marine layer are evaluated and combined to form a model for the changes in pth of the marine layer as a function of time of day and distance from the coast. *Subject eadings:* **1. Marine layer 2. Los Angeles, Calif.**—*Author's abstract.*

12M–955 551.465.5:551.463/4(794)

†Tibby, R. B. and Terry, R. D., **Physical and chemical characteristics of the water over e Southern California Shelf, 1956–1958.** *California. State Water Pollution Control Board,*

Publication, No. 20:111–168, 1959. 27 figs., 3 tables, 43 refs. **DWB** (551.46 C153co)—Oceano
graphic, geographic, geologic and climatic factors that influence the average transparency of th
water over the mainland shelf of Southern California are discussed. The report includes a de
scription of the changes in the temperature, salinity, density and stability of the sea water an
emphasizes how these conditions affect design and predictions. *Subject Headings:* **1. Physica
properties of sea water 2. Transparency of sea water 3. Southern California continenta
shelf.**—*N.N.*

12M–956 551.465.5:551.464(266

Barber, F. G. (*Pacific Oceanographic Group, Nanaimo, B. C., Canada*), **Currents and wate
structure in Queen Charlotte Sound, British Columbia.** *Pacific Science Congress, 9th, Bang
kok, 1957, Proceedings,* Vol. 16, pub. **1958.** p. 196–199. 6 figs. **DWB** (M(06) P117p)—
description of currents and water structure in Queen Charlotte Sound, British Columbia based o
data compiled from recent oceanographic surveys of the oceanic and coastal waters of the north
east Pacific, and particularly of these waters in the Gulf of Alaska. The salinity structure ove
the entire gulf region is described. There is an excess of precipitation over evaporation. Varia
tions in the salinity of source water of deep inflow have a profound effect on the characteristic
of coastal water. This is emphasized by the fact that the period at which the salinity of soun
water is at maximum occurred at a time of maximum run off. Evidently the character of the wate
is dominated more by the deep inflow than by the amount of run off. A consideration of all th
data suggests that complete renewal of the deep and bottom water could occur in a period a
short as two weeks. Salinity charts and current observations at 10, 50, and 125 meter depths ar
included. *Subject Headings:* **1. Salinity structure 2. Water masses 3. Currents 4. Quee
Charlotte Sound, British Columbia 5. Gulf of Alaska.**—*E.Z.S.*

12M–957 551.465.5(266):06(71

Dodimead, A. J. and Tully, J. P. (*both, Pacific Oceanog. Group, Nanaimo, B. C., Canada
Canadian oceanographic research in the northeast Pacific Ocean. *Pacific Science Congres
9th, Bangkok, 1957, Proceedings,* Vol. 16, pub. **1958.** p. 180–195. 12 figs., 8 refs. **DW**
(M(06) P117p)—The principal oceanographic features of the Northeast Pacific Ocean, the ten
perature, salinity, water masses, the current systems, and the summer and winter variations a
described. Although the discussions are illustrated with examples from one summer and o
winter survey, comments are made on the similarities and differences observed in other survey
Synoptic oceanographic surveys were carried out in this area during three summers Aug. 195
1956, and 1957, and one winter, Feb. 1957. The first survey was Project NORPAC. The su
sequent surveys were those sponsored by the Canadian Government. Each survey required abo
six weeks sea time and was made during the period of maximum summer, or minimum wint
temperatures, when oceanographic conditions were most nearly stable. All the data have bee
published in Data Records, in the Manuscript Series of the Fisheries, Research Board of Canad
Charts are included showing the distribution of the oceanographic features discussed. *Subje
Headings:* **1. Salinity data 2. Water mass temperatures 3. Current systems 4. Synopt
oceanographic surveys 5. Project NORPAC 6. Northeast Pacific Ocean.**—*E.Z.S.*

12M–958 551.465.5(26

Fukuoka, J. (*Met. Res. Inst., Tokyo*), **On the variation of the Kuroshio current south
Honshu (Japanese Main Island).** *Geophysical Magazine,* Tokyo, 28(3):343–355, March 195
10 figs., 6 refs. **DLC.** Abstract in: *International Geographical Union, Proceedings of t
Regional Conference, Japan, 1957.* Issued Tokyo, **1959.** p. 117–122. 8 figs., 4 refs., eqs. **DW**
(910.6 I61pr)—The author describes the flow pattern of the Kuroshio as well as the mechanis
of the cold water mass appearance, based upon the data of NORPAC observation in 1955, t
Japanese Navy data in 1938–41 and the Hydrographic Department data of 1950–51. The mo
characteristic feature shown by the charts of water temperature and salinity distribution 1938–
and 1955 is the extreme meandering of the Kuroshio south of the Kii Peninsula. In both 19
and 1955, large warm water masses existed south of Shikoku and east of Choshi, and there w
a cold water mass south of Enshu-nada. Rather small warm water masses are seen east
Amami-Oshima. A similarity from year to year is noticed in the distribution of water mass
and in the flow pattern of the Kuroshio when there is a cold water mass in Enshu-nada. On t
charts for 1950 and 51, the isobars are almost straight lines; the cold water masses south of K
Peninsula have nearly disappeared, though there is still a small cyclonic circulation in the s
near Enshu-nada. The meander of the Kuroshio is studied on the basis of K. KAJIURA's theo
of the flow disturbance caused by bottom topography. It is considered that the variations of t
disturbed flow pattern may be due to the changes of the basic current velocity and current widt
Bottom topography in the sea near Japan is compared with that in the Atlantic Ocean ne

erica, and the meander of the Kuroshio with that of the Gulf Stream. Meanderings such as
t south of the Kii Peninsula, observed for an extended time are not found in the Gulf Stream.
ject Headings: **1. Ocean current meandering 2. Kuroshio Current 3. Japan.**—*A.V.*

12M–959 551.465.5(27)

Fukuoka, Jiro (*Met. Res. Inst., Tokyo*), **On the Kuroshio near the Izu Islands.** *Oceano-
phical Society of Japan, Journal,* 14(1):11–14, March **1958.** 2 figs., ref. **AGU**—A study was
de on the variations of the Kuroshio main current zone. The phenomenon of the Kuroshio
anders east of Miyake-jima may be explained by the effect of the submarine ridge. Two main
rents of the Kuroshio in 1956 may also be explained by the effect of topography, that is, the
figuration of the continental shelf. *Subject Headings:* **1. Kuroshio Current 2. Current
andering 3. Bottom relief 4. Izu Islands, Japan.**—*Author's abstract.*

12M–960 551.463:551.465.5

Fukuoka, Jiro (*Meteor. Res. Inst. Tokyo*), **The variation of the Kuroshio current in the
east of Honshu (Japan's main island) and the existence of a cold water mass east of
yake-jima.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of
ers.* Issued Wash., D. C., AAAS, **1959.** p. 541–545. 2 figs. German summary p. 545.
VB (551.46082 I61 pr)—The appearance of a cold water mass in the sea east of Miyake-jima
u Islands) and the meandering of the Kuroshio in the sea east of Honshu are discussed. The
d water mass has a low temperature and dissolved oxygen content and the data indicate that it
created by the southward cold current (Oyashio). There appears to be a relationship between
s cold water mass and the variations in the zone of the Kuroshio's main current. An analysis
the associated data indicates that the extremely large northward component of the Kuroshio and
meandering are dependent upon the Oyashio and its cold water mass. *Subject Headings:*
Current meandering 2. Water masses 3. Kuroshio Current 4. Miyake-jima, Japan.—*I.S.*

12M–961 551.465.5(265.4)

Hayami, Shoitiro (*Faculty of Science, Kyoto Univ., Kyoto*), **On the dynamics of Kuroshio
the southern coast of Japan.** (In: UNESCO Symposium on Physical Oceanography, Tokyo,
t. 1955, **Proceedings**, pub. **1957.** p. 139. French summary, p. 139.) **DWB**—Bottom topog-
hy affects the course of the deep current and upwelling occurs west of Bonin ridge, however,
en the Kuroshio takes its normal course, the deep current seems to be absent and the Kuroshio
confined to a relatively superficial layer. The deep current may be caused by the change of
eral circulation associated with sun spot activity. *Subject Headings:* **1. Kuroshio Current
Oceanic circulation-sun spot relationships 3. Bottom topographic effects 4. Southern
ast of Japan.**—*E.Z.S.*

12M–962 551.465.5(265.4)

Ichiye, Takashi (*Oceanog. Section, Japan Met. Agency, Tokyo*), **On the variation of oceanic
culation in the adjacent seas of Japan.** (In: UNESCO Symposium on Physical Oceanog-
hy, Tokyo, Oct. 1955, **Proceedings**, pub. **1957.** p. 116–129. 16 figs., 23 refs., 20 eqs. French
nmary, p. 116.) **DWB**—Secular changes of atmospheric circulation are related to the appear-
e of the cyclonic vortex and change in the northern limit of the Kuroshio Current. The annual
le of wind stress is related to the velocity of Kuroshio and to the intensity of vortex. Planetary
ve motion of the Kuroshio is related to the change in the velocity of the Kuroshio and the
plitude of meandering isotherms. The passage of typhoons and cyclones is responsible for
nges in the surface isotherm pattern. *Subject Headings:* **1. Oceanic circulation 2. Kuroshio
rrent 3. Isotherm patterns 4. Japan.**—*E.Z.S.*

12M–963 551.465.5

Ichiye, Takashi (*Japan Met. Agency*), **On the decay of a cyclonic vortex in the southern
a of Honshu (Hydrography of the Kuroshio in relation to its productivity, Pt. 2).** *Records
Oceanographic Works in Japan,* Tokyo, Special Number, No. 2:90–100, March **1958.** 8 figs.,
refs., 5 eqs. **DWB**—The Kuroshio in the southern sea of Honshu flowed with a conspicuous
our around an intense cyclonic vortex between 136°E and 140°E since the autumn of 1953
HIYE, 1955a, 1956b), and such condition seemed to continue for some years, judging from
previous example of the appearance and maintenance of the cyclonic vortex during about ten
rs from 1935 to 1943 or 1944 in the same region. (ICHIYE, 1954a, 1955b.) However, the
sent vortex has almost vanished recently, contrary to the expectation derived from the preced-
case. A description of the process of decay of the vortex is given, with some explanations
cerning the physical process of such change in the oceanographic conditions. *Subject Head-
s:* **1. Oceanic vortices 2. Kuroshio Current.**—*Author's abstract.*

12M–964 551.556:532.593:551.465.5:551.466

Isozaki, I., **The effect of "Kuroshio" current on the northeasterly wind waves over th**
southward sea area off Kanto District. *Journal of Meteorological Research,* Tokyo, 10(3
205–211, March **1958.** 7 figs., 5 tables, 3 refs., eqs. In Japanese; English summary, p. 20
DWB, DLC—The effects of the opposing currents on ocean wave heights and breaking ph
nomenon are estimated by means of the recent spectral concept when northeasterly wind wav
propagate upstream against the Kuroshio Current over the southward sea area off the cape
Iro-zaki, and the modified wave spectra are also studied. The results are as follows: 1) it appea
that the sea condition over the southward sea area off the cape of Iro-zaki is considerably confus
under the action of moderate winds (15 knots or so); 2) when the current speed is increased, t
breaking energy is also increased and then the sea condition is more confused. But the wav
become more regular because the range of significant periods becomes narrower; 3) when t
current speed increases beyond the limiting value, the wave height is reduced. But sea conditio
are more confused because the breaking energy is increased. *Subject Headings:* **1. Ocean cu
rent effects on wind waves 2. Kuroshio Current 3. North Pacific Ocean.**—*Author's abstra*

12M–965 551.526.64:551.465

Masuzawa, Jotaro (*Oceanographic Section, Japan Met. Agency, Tokyo*), **On the cold be
along the northern edge of the Kuroshio (Currents and watermasses of the Kuroshio system
Pt. 8).** *Oceanographical Magazine,* Tokyo, 8(2):151–156, Dec. **1956.** 8 figs., table, 7 re
DWB, DLC—Describes the actual properties of cold belt, based upon the data of the detail
cross-current observations made in 1956 on board the Ryofu-Maru of the Japanese Meteorologic
Agency. Surface current and 100 m depth temperature for June 1952, Feb. 1956, and Se
1956 and Nov. 1956 are graphically represented. Graphical representations of 100 m depth te
perature and surface chlorinity in Aug. 1956 and of cross-current distributions of surface curre
velocity and temperatures in the depths (0, 50, 100, 150, 200 m) along the 145.5°E meridian
Nov. 1956 are also included. The strength of the Kuroshio current in five sections in Nov. 19
is tabulated. *Subject Headings:* **1. Ocean currents 2. Water masses 3. Kuroshio Current.**
I.S.

12M–966 551.526.6:551.465.5(265.

†Masuzawa, Jotaro (*Japan Met. Agency*), **Contribution to the knowledge on the Kurosh
east of Japan (Currents and water masses of the Kuroshio system, Pt. 9).** *Oceanographic
Magazine,* Tokyo, 9(1):21–34, Sept. **1957.** 7 figs., table, 39 refs. **DWB, DLC**—A study
presented on the basic features of the Kuroshio System and its fluctuations. A corresponden
between the Kuroshio System and the Gulf Stream system is shown. Then the paper discuss
the meanderings of the Kuroshio main current and its relationship to water temperature of t
polar frontal zone. Current velocities, transports and water masses in the cross-current secti
of the Kuroshio are considered. Finally, a warm and a cold eddy, north and south of the Kurosh
are mentioned. Several graphic illustrations and tables illustrate the study. *Subject Heading*
1. Ocean currents 2. Water masses 3. Kuroshio Current system 4. Gulf Stream syste
—*I.S.*

12M–967 551.506.22:551.465.5(265.

Masuzawa, Jotaro (*Japan Met. Agency*), **A short-period fluctuation of the Kuroshio ea
of Cape Kinkazan.** *Oceanographical Magazine,* Tokyo, 10(1):1–8, June **1958.** 3 figs., 2 tabl
3 refs. **DLC**—The multiple ship current measurement east of Japan was carried out in Jun
July 1957 as the first oceanographic project in the IGY 1957–1958. Four ships participated: t
"Ryofu-Maru" of Japan Meteorological Agency, "Shumpu-Maru" of Kobe Marine Observato
the "Yushio-Maru" of the Hakodate Marine Observatory and the "Kaiyo" of Marine Saf
Agency. The principal purpose of this project is to obtain a fundamental knowledge on t
mechanism of the northward transport of warmer water. The sea region east of Japan is
original region for mixing in the oceanic polar frontal zone between the subtropical warm wa
(the Kuroshio) and the sub-arctic cold water (the Oyashio). This project placed great empha
on the observation of actual short-period oceanic fluctuations in the northern side of the Kurosh
Subject Headings: **1. Ocean currents 2. Water mass transport 3. Kuroshio Current
Oyashio Current 5. Northwest Pacific Ocean.**—*Author's introduction.*

12M–968 551.526.6:551.465.5(265

Moriyasu, Shigeo (*Kobe Marine Obs.*), **On the fluctuation of the Kuroshio south
Honshū, Pt. 1, Statistical treatment of the displacement of the stream axis.** *Oceanographi
Magazine,* Tokyo, 8(2):143–149, Dec. **1956.** 6 figs., 4 refs., 4 tables **DWB, DLC**—Discus
the distribution of water temperature in relation to the stream axis of the Kuroshio Current, a

reports the displacement of the stream axis from a statistical viewpoint. The fluctuation of the stream axis in 1954–56 is indicated and the equality of the population variance of its displacement in three sections is tested. The fluctuation of the stream axis of Shionomisaki in 1951–53 is compared with that in 1954–56 and the formula for extrapolation of its position is obtained. The prediction by this method is found to be not as successful as expected, showing apparent need of physical treatment for the purpose. The discussion is extensively illustrated. *Subject Headings:* **1. Kuroshio Current system 2. Northwest Pacific Ocean.**—*I.S.*

12M–969 551.465.5

Moriyasu, Shigeo (*Kobe Marine Obs.*), **A short note on the computation of the relative volume transport (On the fluctuation of the Kuroshio south of Honshu, Pt. 3).** *Oceanographical Magazine,* Tokyo, 10(1):81–89, June **1958.** 3 figs., 3 tables, 6 refs., eqs. (For Pt. 2, *see* 10.1–257, Jan. 1959, *Met. Abs.*) **DLC**—We need to find the fluctuation in the intensity of the Kuroshio when we analyze the oceanographic conditions in the sea south of Honshu. But it is very difficult to choose the factor indicating the intensity of the Kuroshio most pertinently. And many factors are used for that purpose, for instance, the transport, the mean current velocity, the maximum current velocity, the width of the current etc. Though each factor is thought to be able to indicate the intensity of the current, the volume transport seems to be most suitable factor from the dynamical viewpoint. As the computation of the absolute volume transport is troublesome, the relative volume transport is commonly utilized for convenience sake. MASUZAWA (1951) computed the volume transport in the sea south of Shionomisaki in this manner and studied its distribution in detail, and SUGIURA (1955) discussed the fluctuation in the eastern sea of Honshu by using the volume transport. Their work presents very interesting results and shows that the volume transport is useful for the analysis of the oceanographic conditions. However, we think that there are some problems which must be taken care of. In this note, they should be considered based on the recent data in the sea south of Shiono-misaki. Moreover, it should be discussed how great significance can be found in computing the relative volume transport up to the great depth in the considered sea area. *Subject Headings:* **1. Kuroshio Current 2. North Pacific Ocean.**—*Author's introduction.*

12M–970 551.461.2:551.465.5:517.512.2(52)

Moriyasu, Shigeo (*Kobe Marine Obs.*), **On the fluctuation of the Kuroshio south of Honshu, Pt. 4, The influence of the oceanographic conditions upon the monthly mean sea level.** *Oceanographical Society of Japan, Tokyo, Journal,* 14(4):137–144, Dec. **1958.** 7 figs., 2 tables, 12 refs., eq. **DWB**—A discussion of the monthly mean sea level in relation to oceanographic conditions, at four tidal stations around the Kii Peninsula. Monthly mean sea level at Kushimoto tidal station, at Uragami and the difference in the sea level between Kushimoto and Uragami are discussed and graphically illustrated. It is shown that sea level, often eliminating the pressure effect, fluctuates mainly according to the oceanographic conditions. This conclusion is further exemplified by presenting two typical examples and by citing the results of the harmonic analysis of the monthly mean sea level. *Subject Headings:* **1. Monthly mean sea level 2. Kii Peninsula, Japan.**—*I.S.*

12M–971 551.465.5(265.4)

Nan'niti, Tosio, (*Met. Res. Inst., Tokyo*), **Relation between the velocity and the location of the front of the Kuroshio off the Tôhoku district.** *Oceanographical Magazine,* Tokyo, 10 (2):185–192, Dec. **1958.** 8 figs., 7 tables, 2 refs., eqs. **DWB, DLC**—Some dynamic calculations pertaining to the Kuroshio and the Oyashio Currents were made, and the relation between the velocity and the location of their fronts off Tôhoku district is studied. The phenomena of fronts are very complicated, and they do not have a definite relation between them but the front is formed at some location irrespective of the velocity of Kuroshio. *Subject Headings:* **1. Kuroshio Current 2. Oyashio Current 3. Current velocities 4. Northwest Pacific Ocean.**—*Author's abstract.*

12M–972 551.465.5:551.526.6

Shoji, D.; Watanabe, Ryuzo; Suzuki, N. and Hasuike, K. (*all, Hydrographic Office, Japan*), **On the "Shiome" at the boundary zone of the Kuroshio and the coastal waters off Shionomisaki.** *Records of Oceanographic Works in Japan, Tokyo,* Special Number, No. 2:78–84, March **1958.** 8 figs. **DWB**—The velocity and surface temperature at the northern boundary of the Kuroshio off Shionomisaki were observed by GEK and a sensitive recording thermometer and it was found that the position of abrupt change of velocity and temperature are not the same and both show a step-wise change. *Subject Headings:* **1. Kuroshio Current 2. Ocean surface temtemperature measurement 3. Current velocities 4. Shionomisaki, Japan.**—*Authors' abstract.*

12M–973 551.465.5

Takenouti, Yositada, **Measurements of subsurface current in the cold-belt along the northern boundary of Kuroshio.** *Oceanographical Magazine,* Tokyo, 10(1):13–17, June **1958.** 2 figs., 6 refs. **DLC**—Multiple Ship Survey in the polar front region operated from June to July 1957 as a program of the IGY. The survey was composed of several operations; these operations were named CM, GS-1, PD-1, GS-2, PD-2, GS-3, IW and GS-4. In the operation PD-1 and PD-2, which were operated during June 19th to 22nd, and June 25th to 26th, respectively, the subsurface current was measured with parachute drogue. The author discusses the results of subsurface current measurements, and explains how the cold belt along the northern boundary of Kuroshio is formed. As is discussed by J. MASUZAWA the oceanographic conditions along the Kuroshio showed remarkable variation during the period of the survey and along with the variations the cold belt to the north of Kuroshio varied its shape and localities, although it was always observed during the survey. *Subject Headings:* **1. Oceanic currents 2. Kuroshio Current 3. Oceanographic surveys.**—*Author's introduction.*

12M–974 551.465.5(265.4)

Uda, Michitaka (*Tokyo Univ. of Fisheries*), **A note on the hydrographical conditions of Kuroshio and its northern boundary in 1956.** *Records of Oceanographic Works in Japan,* Tokyo, Special Number, No. 2:68–77, March **1958.** 4 figs., 3 tables. **DWB**—A brief summary of the hydrographical conditions of Kuroshio and its northern boundary during late July–early Aug. 1956. The results are plotted with reference to water temperature, salinity, dissolved oxygen, and phosphate. These are compared with conditions of other years. Development of a cold current has been recognized in the lower layer of the northeastern sea region of Japan since 1955. *Subject Headings:* **1. Kuroshio Current 2. North Pacific Ocean.**—*N.N.*

12M–975 551.46.077:551.462:551.465.5

Yasui, Masashi (*Central Met. Obs., Tokyo*), **On the rapid determination of the dynamic depth anomaly in the Kuroshio area.** *Records of Oceanographic Works in Japan,* Tokyo, n.s., 2(2):90–96, Oct. **1955.** 5 figs., table, 6 refs., 11 eqs. **DWB**—Dynamic depth anomalies can be calculated from vertical distribution of temperature by using an empirical formula of BJERKNES-SANDSTROM (1910) and SVERDRUP for depths to 1000 m. Data for July 1951 to Nov. 1953 on the G-line section south from Shionomisaki to 30°N (45 sections involving 282 sets of dynamic depth and mean temperature data above 1000 decibars) are used and T-C1 relationship also plotted for the G-line to show that the T-C1 relationship is nearly constant below 18°C (about 200 m) so the C1 factor may be practically ignored. *Subject Headings:* **1. Dynamic depth anomalies 2. Bathythermographs 3. Kuroshio Current.**—*M.R.*

12M–976 551.465.5(265.4)

Hakodate, Japan. Marine Observatory, **Report on the oceanographical observation of the sea off Tohoku District made on board the R.M.S. Yushio-maru in summer 1953 by the Oceanographical Section, Pt. 1.** Its *Bulletin,* No. 2, (Contribution No. 1), June **1956.** p. 119–124 of reprint (unidentified). 4 figs., 3 tables. In Japanese; English summary p. 119. **DWB**—The oceanographic conditions of the waters off Tohoku District were investigated on the basis of observations made on board the R.M.S. "Yushio-maru" during 23 Aug. to 5 Sept. 1953. A southward strong current was observed at the boundary between Oyashio and Tsugaru warm current, which velocity was estimated to be 0.9 knots by dynamical calculation. A branch of Kuroshio extension was observed as a clockwise circular current, with the centre at 39.5°N, 144.8°E and the velocity 0.7–1.0 knots. The transport of these currents were estimated to be of the order of $7 \times 10^6 m^3$/sec, and $6 \times 10^6 m^3$/sec, respectively. Some considerations were also made with regard to water temp., chlorinity and dissolved oxygen. *Subject Headings:* **1. Oceanographical observations 2. Oyashio Current 3. Kuroshio Current 4. Northwest Pacific Ocean.**—*Author's abstract.*

12M–977 551.46.06:551.465.5(265.4)

Hakodate, Japan. Marine Observatory, **Report of the oceanographic observations east of Tôhoku District in Nov. 1955, by the Oceanographical Section.** Its *Bulletin,* No. 3 [Contribution No. 6], Dec. **1956.** p. 11–19 of reprint (unidentified). 20 figs. In Japanese; English summary p. 11. **DWB**—The Oyashio flows south along the line of long. 144°E and reaches as far as lat. 39°N. In the Oyashio region, surface water temp. is lower than in normal year, and characters of cold current are also observed clearly by the B.T. records, dissolved oxygen and microplankton observations. A branch of the Kuroshio Current is observed as an eddy at 41.5°N, 145°E to the east of the Oyashio region. Conditions of the Tsugaru current are normal. *Subject Headings:* **1. Oceanographic data analysis 2. Temperature data 3. Dissolved oxygen data**

4. Microplankton distribution data 5. Oyashio Current 6. Kuroshio Current 7. Tsugaru Current.—*Author's abstract.*

12M–978 551.506.1:551.465.5(265.4)

Hakodate, Japan. Marine Observatory, **Report of the oceanographic observations in the sea east of Tōhoku District from Feb. to March 1957.** Its *Bulletin,* No. 5 [Contribution No. 1], Dec. **1958.** 9 p. 20 figs. In Japanese; English summary p. 85. Reprint from unidentified source, p. 85–93. **DWB**—1. In the sea west of long. 146°E, the current velocity of the Oyashio is less than 0.5 kt and its coastal branch extends in a rather small area compared with 1955 and 1956. 2. The Tsugaru warm current extends eastward as far as long. 143°E, and the Oyashio coastal branch shifts eastward compared with the normal year. 3. But it seems that, the remarkable extension of the Tsugaru warm current referred to above occurred in a rather short period, and it returned to the normal pattern after the period of this observation. *Subject Headings:* **1. Oceanographic data analysis 2. Oyashio Current 3. Tsugaru Current.**—*Author's abstract.*

12M–979 551.506.1:551.465.5(265.4)

Hakodate, Japan. Marine Observatory, **Report of Oceanographic observations in the sea east of Tōhoku District from Nov. to Dec., 1957.** Its *Bulletin,* No. 5, [Contribution No. 5], **Dec. 1958.** Reprint from unidentified source, p. 1–7. 6 p. 12 figs. In Japanese; English summary p. 1. **DWB**—A mass of Kuroshio water is found as a large clockwise eddy with its center at lat. 41°N, long. 144.5°E east off Hachinohe. It has high temp. and chlorinity, low dissolved oxygen, and microplankton of mixed water character. To the south of the warm eddy above mentioned, a water mass of cold Oyashio is found extending from west to east off Miyako. It has low temp. and chlorinity, high dissolved oxygen and is characterized by the cold species of microplankton. The area of the Tsugaru warm current is rather small and its temp. is rather low compared with the normal year. *Subject Headings:* **1. Oceanographic observations 2. Temperature data 3. Chlorinity data 4. Dissolved Oxygen 5. Microplankton 6. Kuroshio Current 7. Oyashio Current 8. Tsugaru Current 9. Northwest Pacific Ocean.**—*Author's abstract.*

12M–980 551.465.5:551.464:551.526.6(265.4)

Sugiura, Jiro (*Hakodate Marine Observatory*), **Variations of sea conditions in the sea south off Hokkaidō.** *Oceanographical Magazine,* Tokyo, 9(1):121–131, Sept. **1957.** 14 figs., 4 refs. **DWB, DLC**—The paper is based upon the recent oceanographical data obtained by research ships operated by the Japan Meteorological Agency and the Maritime Safety Agency in 1946–1956, with special reference to the northern seas, north of latitude 38°N. It deals with the Oyashio region and with the cold western mixed water region in which three water systems—the Oyashio, the Kuroshio and the Tsugaru Warm Current—mix with each other. Interannual mean of temperature and chlorinity covering the area 38–43°N and longitude 141.5–147°E is computed and graphically represented. Later variations in each year are discussed. Oceanographic conditions in different periods are graphically represented. *Subject Headings:* **1. Oyashio Current 2. Kuroshio Current 3. Tsugaru Current 4. Northwest Pacific Ocean.**—*I.S.*

12M–981 551.465.5(265.4)

Sugiura, Jiro (*Hakodate Marine Obs.*), **On the Oyashio current in the sea adjacent to Hokkaido.** *Oceanographical Magazine,* Tokyo, 9(1):133–142, Sept. **1957.** 9 figs., 11 refs. **DWB, DLC**—Describes the current pattern and stratification of the water mass of the Oyashio current off northern Japan, based upon the oceanographic data obtained by the R.M.S. "Yūshio-Maru" of the Hakodate Marine Observatory every season of the year. Velocity and transport values of Oyashio current are calculated and discussed. The Oyashio countercurrent and the littoral current were also studied. Numerous graphical illustrations and tables are included. *Subject Headings:* **1. Oyashio Current 2. Littoral currents 3. Water masses.**—*I.S.*

12M–982 551.465.5(265.4)

Sugiura, Jiro, **A note on current branches in the Oyashio area.** *Hakodate, Japan. Marine Observatory, Bulletin,* No. 4 [Contribution No. 7], Dec. **1957.** p. 117–119 of reprint (unidentified). 3 figs., 8 refs. In Japanese; English summary p. 117. **DWB**—There are observed several current branches in the Oyashio area. The author named these branches as (a) Oyashio main current, (b) Oyashio counter current, (c) neritic water current off the coast of Tokachi. The characteristics of each branch were investigated. Further, origins of the so called first branch and second branch of the Oyashio those observed in the sea east of Honshu were investigated. *Subject Heading:* **1. Oyashio Current system.**—*Author's abstract.*

12M–983 551.506.1:551.465.5(265.4)

Hakodate, Japan. Marine Observatory, **Report of the oceanographic observations of the Okhotsk Sea from April to May, 1956 by the Oceanographic Section and Marine Meteorological Section.** Its *Bulletin,* No. 4, (Contribution No. 2), Dec. 1957. p. 105–112 of reprint (unidentified. 15 figs. In Japanese; English summary, p. 105. **DWB**—Oceanographic conditions of the waters of Okhotsk Sea along the coast of Hokkaidō were investigated on the basis of observations made on board the R.M.S. "Yūshio-Maru" during 18 April to 6 May 1956. In the Okhotsk Sea, warm water was flowing to the southeast along northeast coast of Hokkaidō (so called the Sōya current), and cold and low chlorinity water was flowing to northwest in the offing of the Sōya Current. On April 30th, "Yūshio-maru" reached the limit of drift ice off the coast of Abashiri and aerial observations were carried out near drift ice, and bathythermometer records were obtained. In addition to observations of water temp., chlorinity, dissolved oxygen and microplankton, 100 drift bottles were distributed. Among them two bottles released in the Okhotsk Sea were found at Pacific coast of Hokkaidō. *Subject Headings:* **1. Oceanographic observations 2. Temperature distribution 3. Chlorinity distribution 4. Drift ice 5. Drift bottle observations 6. Dissolved oxygen distribution 7. Microplankton 8. Okhotsk Sea.** —*Author's abstract.*

12M–984 551.506.1:551.465.5(265.4)

Hakodate, Japan. Marine Observatory, **Report of the oceanographic observations in the Okhotsk Sea in April 1957.** Its *Bulletin,* No. 5, [Contribution No. 2], Dec. **1958.** Reprint from unidentified source, p. 139–145. 7 p. 21 figs. In Japanese; English summary p. 139. **DWB**—In the Okhotsk Sea, the very cold (0 ~ 1°C) and low chlorinity (18.0‰) water mass developed and extended closer to the coast of Hokkaidō in April, 1957 than in the same period of the previous year. Corresponding it, the Sōya warm current (3 ~ 4°C, 18.6‰) was weaker than in the previous year. These conditions were found by the distribution of microplankton. That is in the Okhotsk Sea, the *Pragilaria* group, composed of cold neritic species, prevails in a large area. As same in the last year, the drift ice field of the Okhotsk Sea was observed on this cruise and ice conditions as well as sea conditions near the drift ice were investigated. *Subject Headings:* **1. Oceanographic observations 2. Temperature data 3. Chlorinity data 4. Microplankton distribution data 5. Ice drifts 6. Okhotsk Sea.**—*Author's abstract.*

12M–985 551.506.1:551.465.5(265.4

Hakodate, Japan. Marine Observatory, **Report of the oceanographic observations in the sea east of Tōhoku District and the Okhotsk Sea from Aug. to Sept., 1957.** Its *Bulletin,* No. 5, [Contribution No. 4], Dec. **1958.** Reprint from unidentified source, p. 155–169. 15 p. 57 figs. In Japanese; English summary p. 155. **DWB**—In the Tsugaru Straits the maximum current velocity of 3.5 knots is measured with GEK at the west entrance of the straits. A low chlorinity surface water flows from the Japan Sea into the straits and forms a narrow tongue. In the sea east of northern Japan, the Tsugaru Warm Current flows as usual in summer and it velocity is about 2.0 knots. The Oyashio coastal branch flows to the south as far as lat. 39.5°N, and so the surface temp. of the sea south of Hokkaidō is rather low. The sea east of Hokkaidō to the north of lat. 43°N is completely occupied by the Oyashio cold water, its minimum temp. being 1.1°C at about 100 m depth. In the Okhotsk Sea, the Sōya Warm Current flows to the south-east near the coast of Hokkaidō, its surface temp. is 18°C in the maximum and it maximum velocity is 2.7 knots. It is mixed with a cold Okhotsk water at the north of the southern Kurile Islands. Its maximum chlorinity is 18.65‰ at 30 m depth and maximum current velocity of 1.6 knots is measured in this water. Between the Sōya Current and the mixed water above mentioned, a very cold water mass of Okhotsk Sea is found. Its minimum temp. is — 1.6°C at about 100 m depth. The surface water temp. of the Okhotsk Sea is a little lower than in the normal year. The above mentioned characteristic features of oceanographic conditions are verified from the chemical elements and diatom distributions. *Subject Headings:* **1. Oceanographi observations 2. Temperature data 3. Chlorinity data 4. Diatom distribution data 5 Current velocities 6. Tsugaru Strait 7. Okhotsk Sea.**—*Author's abstract.*

12M–986 551.506.1:551.465.5(265.4

Hakodate, Japan. Marine Observatory, **Report of the oceanographical observations i the sea east off Tōhoku District in May–June, 1955, by the Oceanographical Section.** It *Bulletin,* No. 3, [Contribution No. 4], Dec. **1956.** p. 11–16 of reprint (unidentified). 15 figs In Japanese; English summary p. 11. **DWB**—The oceanographic conditions of the waters o Tōhoku District were investigated by observations made on board the R.M.S. "Yūshio-Maru during May 17 to June 10, 1955. According to water temp., chlorinity, density current an microplanktological conditions the conditions of the Kuroshio, the Oyashio and the Tsugaru war urrent were analyzed It is considered that, the features of the sea conditions in this season ere the same as those in 1951. *Subject Headings:* **Oceanographic data analysis 2. Tempera- ure distribution 3. Chlorinity distribution 4 Density current data 5. Microplankton dis- ibution 6. Current systems 7. Northwest Pacific Ocean.**—*Author's abstract.*

12M–987 551.506.1:551.465.5(265.4)
Hakodate, Japan. Marine Observatory, **Report of the oceanographical observations east f Tohoku District from Aug. to Sept. 1955 by the Oceanographical Section.** Its *Bulletin,* o. 3 [Contribution No. 5], Dec. **1956.** p. 13–21 of reprint (unidentified). 23 figs. In Japanese; nglish summary, p. 13. **DWB**—The oceanographical conditions of the waters off Tōhoku Dis- ict were investigated by observations made on board the R.M.S. "Yūshio-Maru" from Aug. 11 Sept. 4, 1955. This observation was planned to participate in the NORPAC Expedition as ell as to complete a part of routine oceanographic observations in cooperation with Central Mete- ological Observatory and other marine observatories. In this report we studied the hydrography f these waters using the observational data of water temp., chlorinity, B.T. records, dynamic epth, oxygen, phosphate-P and microplankton. *Subject Headings:* **1. Oceanographic observa- onal data 2. Temperature data 3. Chlorinity data 4. B.T. records 5. Oxygen data 6. hosphate data 7. Microplankton distribution 8. Sea east of Tōhoku, Japan.**—*Author's bstract.*

12M–988 551.506.1:551.465.5(265.4)
Hakodate, Japan. Marine Observatory, **Report of the oceanographic observations in the a east of Tōhoku District from Feb. to March, 1956 by the Oceanographical Section.** Its *ulletin,* No. 4 [Contribution No. 1], Dec. **1957.** p. 49–57 of reprint (unidentified). 22 figs. In apanese; English summary p. 49. **DWB**—Wintery oceanographic conditions of the waters off ōhoku District were investigated on the basis of the regular observations made on board the .M.S. "Yūshio-Maru" during Feb. 19 to March 23, 1956. The results are summarized as follows. Near the coast of Kushiro, the cold Oyashiro current showed velocity up to about 1 ~ 1.5 knots, nd the coastal branch of the Oyashio flowed southwards close to the coast of Sanriku and reach- g as far as lat. 38°N. 2. To the east of long. 144°E a modified Kuroshio water was observed reading widely as far as lat. 41.5°N. 3. Distributions of dissolved oxygen and phosphate-P dicated generally the correspondence with the current and water mass distribution studied by mp. and chlorinity. 4. According to micro-planktological conditions, the Oyashio region was vided in two, the one was the oceanic Oyashio region in which cold water species of *Subgen haeoceros* were predominant and the other was the neritic Oyashio region in which genus Thalas- osira was predominant. *Subject Headings:* **1. Oceanographic observations 2. Current veloci- es 3. Chlorinity distribution 4. Dissolved oxygen 5. Phosphate distribution 6. Tem- erature distribution 7. Sea East of Tōhoku district, Japan.**—*Author's abstract.*

12M–989 551.506.1:551.465.5(265.4)
Hakodate, Japan. Marine Observatory, **Report of the oceanographic observations in the a east of Tōhoku District from May to June, 1956 by the Oceanographical Section.** Its *ulletin,* No. 4 [Contribution No. 3], Dec. **1957.** p. 113–119 of reprint (unidentified). 14 figs. Japanese; English summary, p. 113. **DWB**—Spring oceanographic conditions of the waters off ōhoku District were investigated using the results of observations made on board the R.M.S. Yūshio-Maru" during 21 May to 12 June 1956. The results are summarized as follows: A emarkable clockwise eddy of the Kuroshio water with its center at 41.5°N, 146°E (so called the arm water mass off Hokkaido) was observed. To the southeast of this clockwise eddy, the econd branch of the Oyashio (the off shore branch of the Oyashio) was observed. The first anch of the Oyashio (the coastal branch of the Oyashio) reached nearly to 39°N but the in- nsity of the branch was rather weak. *Subject Headings:* **1. Oceanographic observations 2. urrent systems 3. Sea east of Tōhoku, Japan.**—*Author's abstract.*

12M–990 551.506.1:551.465.5(265.4)
Hakodate, Japan. Marine Observatory, **Report of the oceanographic observations in the a east of Tōhoku District in Aug. 1956 by the Oceanographic Section.** Its *Bulletin,* No. 4 Contribution No. 5], Dec. **1957.** p. 1–12 of reprint (unidentified). 21 figs. In Japanese; Eng- sh summary, p. 1. **DWB**—The warm water mass off Hokkaidō was observed north of its usual sition, and the warm water reached near the coast of Hokkaidō. The Oyashio current was vided by the warm water mass. The first branch of the Oyashio was cold and fresh and ached south in the usual manner. The second branch of the Oyashio was rather obscure. But branch of the Oyashio flowed toward the west in 41°N, 149°E. The area of the Tsugaru warm rrent was smaller than in May. To the west of long. 144°E, the Kuroshio water was not

observed north of lat. 38°N, but the Kuroshio water spreads to lat. 40.5°N between long. 145° 149°E. *Subject Headings:* **1. Current system observations 2. Oyashio current 3. Tsug current 4. Kuroshio current 5. Sea east of Tōhoku, Japan.**—*Author's abstract.*

12M–991 551.506.1:551.465.5(265

Hakodate, Japan. Marine Observatory, **Report of the oceanographic observations in sea east of Tōhoku District from Oct. to Nov. 1956 by the Oceanographical Section.** *Bulletin,* No. 4 [Contribution No. 6], Dec. 1957. p. 1–8 of reprint (unidentified). 14 figs. Japanese; English summary p. 1. **DWB**—The first branch of the Oyashio flowed southw and reached as far as lat. 39°N. Its temp. was higher than in an average year. The sec branch of the Oyashio reached to lat. 39.7°N. long. 147.2°E. The Tsugaru warm current tended as usual, but its temp. was rather high and its chlorinity was lower than in an aver year. The Kuroshio water was found as a clockwise eddy with its center at lat. 39.5°N. lo 144.5°E. *Subject Headings:* **1. Oceanographic data analysis 2. Temperature distribut 3. Chlorinity distribution 4. Current systems 5. Sea east of Tōhoku, Japan.**—*Auth abstract.*

12M–992 551.506.1:551.465.5(265

Hakodate, Japan. Marine Observatory, **Report of the oceanographic observations in sea east of Tōhoku District in May, 1957.** Its *Bulletin,* No. 5 [Contribution No. 3], Dec. 19 Reprint from unidentified source, p. 147–154. 8 p. 22 figs. In Japanese; English summary 147. **DWB**—A clockwise eddy of the Kuroshio water was close to the coast of Miyako Hachinohe. Its surface temp. was 15°C and surface chlorinity was 19.20‰. This eddy located farther west than in a normal year. On the contrary, in the sea southeast of Kush the Kuroshio water which is usually observed was not found. So, the cold Oyashio water cove a larger area in the sea south off Hokkaidō. 2. The Oyashio water region can be divided into parts by planktological properties; the one characterized by the *Thalassiosira Fragilaria* group the other by cold water species of the *Tyalochaete* group. *Subject Headings:* **1. Oceanograp observations 2. Temperature data 3. Chlorinity data 4. Plankton distribution data Kuroshio Current 6. Oyashio Current 7. Sea east of Tōhoku, Japan.**—*Author's abstract.*

12M–993 551.465.

Kawakami, Kiyoshi (*Hydrographic Div., 1st R.M.S., Ataru*), **The report of the drift-bo experiments at the west entrance of Tsugaru Strait, Hokkaido, Japan, Pt. 1.** *Oceanograph Society of Japan, Journal,* 13(4):131–137, Dec. 1957. 5 figs., 4 tables. **DWB**—This report su marizes the result of drift-bottle experiments at the west entrance of Tsugaru Strait, Hokka Japan, which were carried out twelve times during May 1956 to March 1957, where 12000 dr bottles were dropped. There are two types of recovery of drift-bottles, the one is "SUMM TYPE" and the other is "WINTER TYPE." 452 drift-bottles were recovered and 32.5% them had drifted to the coast of Japan Sea, 39.4% to the coast of Tsugaru Strait and 28% to coast of Pacific. During February, they drifted mostly to the coast of the Japan Sea, dur October and November to the coast of Tsugaru Strait and during May and January to the co of Pacific. The state in which the current of Tsugaru Strait branches from the Tusima curr is very variable depending on time and place. *Subject Headings:* **1. Ocean currents 2. D bottle measurements 3. Tsugaru Strait, Japan.**—*Author's abstract.*

12M–994 551.46.085:551.465(265

Kawakami, Kiyoshi (*Hydrographic Div., 7th R.M.S. Hqs., Moji*), **The report of the dr bottle experiments at the west entrance of Tsugaru Strait, Hokkaido, Japan, Pt. 2.** *Oc nographical Society of Japan, Tokyo, Journal,* 15(1):5–10, March 1959. 5 figs., 2 tables, In Japanese; English summary p. 5. **DWB**—In continuation of the 1st report (*see* 12M–99 the results of drift-bottle experiments at the West entrance of Tsugaru Strait, Hokkaido, Jap which were carried out twelve times during April 1957 to March 1958, are summarized in report. The main features are as follows: (1) On recovering of drift-bottles, "SUMMER TYP and "WINTER TYPE" were observed as in the 1st report. (2) Three hundred and five dr bottles were recovered (452 drift-bottles in the last experiments) and 53% of them drifted to coasts of the Japan and Okhotsk Sea (33% in the last experiments), 34% to the coast of Tsug Strait (39%) and 13% to the coast of Pacific (28%). (3) Seven drift-bottles drifted dur April to Aug. to the coast of Okhotsk Sea where none drifted in the previous experiments. Most of the drift-bottles which were dropped near the coast at station No. 1, 2, 9 and 10 w recovered along the coast of Tsugaru Strait and the Pacific. But most of drift-bottles wh were dropped off the coast at the station No. 3 to 8 were recovered on the coast of the Japan *bject Headings:* **1. Drift-bottle experiments 2. Current systems 3. Tsugaru Strait, Japan.** —*Author's abstract.*

12M–995 551.465(265.4)

Sugiura, Jiro (*Hakodate Marine Obs.*), **On the Tsugaru warm current.** *Geophysical Maga- ıe,* Tokyo, 28(3):399–409, March **1958.** 9 figs., 6 refs. **DLC.** Also issued as *Hakodate, pan. Marine Observatory, Bulletin* No. 5 [Contribution No. 8], Dec. **1958.** [11 p.] 9 figs., refs. **DWB**—Report of the current pattern and stratification of the water mass of the Tsugaru arm Current in the Japan Sea is based on data covering every season. Two important con- lerations are newly set forth: 1) The current may be regarded as a small scale model of a pical warm current such as the Kuroshio and the Gulf Stream; 2) The coastal branch of the yashio may be strengthened by itself on one occasion, but on another occasion by the Tsugaru urrent. Water mass, velocity and extension of the current show considerable annual variations. general the current is weak in winter and spring and strong in summer and autumn. In sum- er and autumn in the sea between Shiriya-saki and Erimo-misaki the current is observed usually a clockwise eddy, while in winter and spring the water is observed often as a body of inter- ediate warm water. Vertical sections and detailed data on temperature, chlorinity, velocity, ssolved oxygen, direction, etc. are presented. The temperature above 200 m depth is higher an 7°C throughout the year and the chlorinity higher than 18.70‰. The maximum velocity of e current measured with GEK is 2.3 kt, while dynamic calculation gives 1.4 kt. Its maxi- um transport is 10 million m^3/sec. Some peculiarities of the Tsugaru Current which appear casionally are discussed. *Subject Headings:* **1. Ocean currents 2. Tsugaru Current 3. orthwest Pacific Ocean.**—*A.V.*

12M–996 551.506.1:551.465.5(265.4)

Hakodate, Japan. Marine Observatory, **Report of the oceanographical observations east f Sanriku district in 1954 by the Oceanographical Section.** Its *Bulletin,* No. 3, [Contribu- on No. 2], Dec. **1956.** p. 25–45 of reprint (unidentified). table, 4 refs., 55 eqs. In Japanese; nglish summary p. 25. **DWB**—The oceanographical observations were made in the sea east of anriku on board the R.M.S. "Yūshio-Maru" during Feb. 22 to Mar. 19, May 22 to June 10, ug. 7 to 26 and Nov. 30 to Dec. 17, 1954. The fluctuation of oceanic conditions was investi- ted by means of studying the distribution of the water temp., chlorinity, dissolved oxygen and rrents. 1. The northward extension of the Kuroshio-branches was remarkable off the coast Sanriku, and the warm water mass was observed at points farther north than in normal years. The Oyashio cold water appeared in one place to the south-east off the Kuroshio and in two aces to the east off Miyako, and the near shore one was not so remarkable and the off-shore one as strong reaching farther southward than normal years in winter to spring 1954. 3. After ssing off Shiriya-saki the Tsugaru warm current was not so strong during 1954, and the undary between the Oyashio current and the Tsugaru warm current was observed at 142–143°E d the velocity was slower than in 1947–1948. 4. According to the water temp., chlorinity and anktological conditions, this sea area is classified as shown. The principal element of the icroplankton occurred in this area, and the maximum number of diatom species was found in Kuroshio" waters in Aug. and May, and the minimum in "Tsugaru" current waters in March d May. The cell numbers are the largest in May, and the smallest in March and Dec. The nstituents of the diatom communities in the "Oyashio" current are generally invariable through e year, while in the other coastal waters they frequently alternate with seasons. But each area each season possesses characteristic constituents. *Subject Headings:* **1. Oceanographic ob- rvations 2. Temperature distribution 3. Chlorinity distribution 4. Dissolved Oxygen Plankton distribution 6. Current systems 7. East of Sanriku District, Japan.**—*Author's stract.*

12M–997 551.465.5(265.4)

Akagawa, Masaomi, **On the oceanographical conditions of the North Japan Sea (west f the Tsugaru-Straits) in summer, Pt. 1.** *Hakodate, Japan. Marine Observatory, Bulletin,* . 3 [Contribution No. 7], Dec. **1956.** p. 189–199 of reprint (unidentified). 5 figs., 2 tables, refs., eqs. In Japanese; English summary, p. 189. Pt. 2, *Ibid.,* (Contribution No. 8). p. 5– of reprint (unidentified). 6 figs., 2 tables, 8 refs., 4 eqs. In Japanese; English summary, 5. **DWB—(Pt. 1)** Investigations on the oceanographical conditions of the Japan Sea have en made already by many authors. The present author discusses synoptically the general oceano- aphical states of the North Japan Sea (west off the Tsugaru-Straits) in summer. From the vestigations the followings are made clear. (1) The stratification of water masses in the Japan a is complex being composed of the coastal water, the surface and middle layer water of ushima warm current, the intermediate water, the deep and bottom layer water, the surface

layer water of Liman cold current, etc. (2) The intermediate water, the deep and bottom la
water in the Japan Sea, are very different from that of other oceans. (3) The surface layer w
has three branch currents and this fact is important in this area. (4) Water masses diffuse
are modified by lateral mixing along the isentropic surface (isopycnal surface). (5) It is
sidered that in the Japan Sea, water temp. distribution and vertical stability show the motion
water masses and chlorinity or dissolved oxygen, and the origin of water masses. **Pt. 2**—In
paper, the current system of the North Japan Sea (adjacent to the Tsugaru-Straits) is discus
It was found that the currents are much influenced by the bottom topography and that in o
to study the current system of the Japan Sea, drift bottle observations taken especially in
season from spring to summer when monsoon does not prevail are very useful. *Subject Headin*
1. Temperature distribution 2. Chlorinity distribution data 3. Dissolved Oxygen 4. C
rent system 5. Bottom topographic effects 6. North Japan Sea.—*Author's abstract.*

12M–998 551.465.5:551.526.6(26

Fukuoka, Jiro (*Meteorological Research Institute*), **On the variation of oceanic conditi**
in the sea adjacent to Japan. *Oceanographical Magazine,* Tokyo, 9(1):95–106, Sept. 1
17 figs., 2 tables, 14 refs. **DWB, DLC**—Describes the variation of water temperature at the c
and in the open sea, and discusses the variation of flow pattern in the ocean. A map show
water temperature observation stations is included. Some information on coastal water temp
tures is presented, and maximum and minimum water temperature for several stations in Ja
are graphically represented. The paper discusses further the variations of the oceanic condit
east and south of Honshu. Finally, the ocean current in the low latitude and in the Japan
is considered. The study is extensively illustrated. *Subject Headings:* **1. Oceanic conditi**
2. Ocean currents 3. Coastal water temperatures 4. Temperature of sea water 5. Ja
—*I.S.*

12M–999 551.506.1:551.465.5(26

Hakodate, Japan. Marine Observatory, **Report of the oceanographic observations in**
Tsugaru Straits in July, 1956 by the Marine Meteorological Section and Oceanograph
Section. Its *Bulletin,* No. 4 [Contribution No. 4], Dec. **1957.** p. 13–21 of reprint (unid
fied). 16 figs., table. In Japanese; English summary, p. 13. **DWB**—The oceanographic obse
tions in the Tsugaru-straits were carried out on board the R.M.S. "Yūshio-Maru" in July 1
The results are as follows: 1. The Tsushima warm current water, the coastal water and t
mixing water are analyzed. 2. The Tsushima warm water is remarkably modified by the pro
of lateral or vertical mixing with the coastal water prevailing in the Tsugaru-straits. 3. A br
of the Tsushima warm current flows northwards and the other flows in the Straits at 30 n
off Gongen-zaki. In the Straits, the main current flows at the velocity of 5 knots or s
Shirakami-Tappi Line and Hakodate-Ōma Line and is accompanied by coastal countercurr
and many vortexes. These current patterns were also estimated with drift bottles. 4. The c
acteristics above stated are also recognized from the distribution and composition of micropl
ton. 5. It is to be noticed that the oceanographic conditions in this area fluctuate locally an
short periods. *Subject Headings:* **1. Current systems 2. Microplankton distribution**
Tsugaru Strait, Japan.—*Author's abstract.*

12M–1000 551.46.062.5:551.463:551.464:551

Hee, Soo Han; Dong, Hwan Bae; Kwang, Iyun Shin et al., **A note on temperature**
salinity changes of the Tsushima current along the eastern coast of Korea, 1930–
International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers. Is
Wash., D. C., AAAS, **1959.** p. 549. In English and German. **DWB** (551.46082 I61pr)—
tendencies of temperature and salinity change are reviewed by using the data collected from
eastern offshore stations during the period 1930–1958. The fluctuations in the strength of
Tsushima current, a branch of the Kuroshima current, which significantly influence the dist
tion of water temperature and marine products are discussed. *Subject Headings:* **1. Tsush**
Current 2. Temperature variations 3. Salinity variations 4. Eastern Coast of K
I. Jong, Soo Hou.—*Authors' abstract.*

12M–1001 551.465.5:621.039:539.16(2

Hishida, Kozo (*Kobe Marine Obs.*) and Yamamoto, Katsumi (*Maizuru Marine Obs.*),
the radioactivity in the sea water off Kyogamisaki in the Japan Sea. *Umi to Sora* (*Sea*
Sky), Tokyo, 34(4): 85–86, **1958.** fig., table, 3 refs. In Japanese; English summary p
DLC—The authors tried to measure the intensity of radioactivity and its seasonal variation
radioactivity at layer of 0 m cpm/1oL and of 10 m–150 m cpm/1oL during the period from
1956 to April 1957 by sampling waters off Kyogamisaki near Maizuru in the Japan Sea.

ent was carried out by the TEN 100 type and G-M Counter (G-M 131, thickness of glass- 2.80 mg/cm^2). Some results obtained are tabulated in this report. *Subject Headings:* **dioactivity in ocean water 2. Japan Sea.**—*K.C.*

2M–1002 551.46(265.4) **551.506.1**(26)

Japan. Meteorological Agency, Tokyo, **Results of Marine Meteorological and Oceano- hical Observations, No. 21, Jan./June 1957, issued March 1958.** 167 p. 2 charts. Also 22, July/Dec. 1957, issued **1958(?)**. And **No. 23**, Jan./June 1958, issued March **1959. 24**, July/Dec. 1958, issued Nov. **1959**. And **No. 25**, Jan./June 1959, issued Aug. **1960.** p.) **Supplement** issued July **1960.** (149 p.) All almost entirely tables. **DWB**—Oceano- ic (air temperature, wind velocity, wind wave, swell, etc.), chemical, bathythermograph, nt, plankton and marine meteorological (pressure, temperature, dew point temperature, wind, , visibility, weather, etc.) data are presented in extensive tables, covering observations made several weather ships around Japan. The observations wer made at varying intervals al times a day, on selected days of the report period. (For abstracts on earlier results, *see* 4, 9E–54 and 9E–117, Feb. 1953 and May 1958, *MAB.*) *Subject Headings:* **1. Marine orological data 2. Oceanographic observations 3. Weather ships 4. Northwest Pacific n.**—*G.T.*

2M–1003 551.465.5:551.326.7(52)

Kawakami, K., **Sea ice on the coast of Hokkaidō Dec. 1956–April 1957.** *Japan. Maritime y Board, Hydrographic Bulletin,* No. 61:50–64, Oct. **1959.** figs., tables. In Japanese; Eng- summary p. 50.—This is the summary of the result of observation of sea-ice conditions along oast of Hokkaidō from Dec. 1956 to April 1957. Surveys were made by the Hydrographic sion, 1st Regional M.S.B. Hqs. with coordination of Maritime Safety Stations, lighthouses, l vessels and aircraft. The conditions of sea-ice were as shown. Other important data are llows: (a) It was very mild from mid Jan. to end of Feb. and the cold number for the area as follows: Omu with 505.0 was the highest followed by Kitamiesasi with 470.4. Other areas nportance were Abashiri with 436.5, Kusiro with 537.4 and Nemuro with 317.1. (b) The ce started to form in mid Dec. 1956 and melted away in first part of April 1957. At the period (from mid Jan. to end of Feb.) it was not surveyed. (c) The period of fast-ice was days being longest at Nemuro, followed by 104 days at Abashiri. However Nemuro with lays and Omu, Monretu with 88 days had actually the most days of fast-ice. The period of -ice was 103 days at Notoro and Monhetu, followed by 97 days at Nemuro. However ro with 83 days and Nemuro with 76 days had actually the most days of drift ice. (d) The and sea-routes between Wakkanai and Kusiro via Abashiri were impeded by sea-ice for a d extending anywhere from 5 to 94 days. However, the actual days when the sea-ice im- l the sea lane was from 5 to 92 days. The number of fishing boats reported in distress due ea-ice was 13. *Subject Headings:* **Sea ice observations 2. Coastal-sea ice conditions okkaido, Japan.**—*Author's abstract.*

2M–1004 **551.509.58**:551.465.5(265.4)

Koizumi, Masami (*Nagasaki Marine Obs.*), **On the forecast of oceanographic conditions e seas west of Japan.** *Oceanographical Magazine,* Tokyo, 9(1):43–49, Sept. **1957.** 2 figs. **3, DLC**—The characteristics of the oceanographic conditions in seas west of Japan are sur- l. First, the distribution of water masses in this sea area are discussed and graphically sented. Then, seasonal change of sea-surface temperature and general character of the water es and their mutual relations are studied. Finally, the problem of forecasting of oceanographic tions is considered. The points in favor and the difficulties are enumerated. It is concluded much more information would be needed to develop a good method of forecasting. *Subject lings:* **1. Oceanographic observations 2. Oceanographic forecasting 3. Seas west of n.**—*I.S.*

2M–1005 **551.526.6**:551.465.5(265)

Leonov, A. K., **O nekotorykh osobennostiakh termiki i techenii Iaponskogo moria.** rmals and currents of the Japan Sea.] *Vsesiuznoe Geograficheskoe Obshchestvo, Leningrad, tiia,* 90(3):243–264, **1958.** 13 figs., 2 tables, 6 refs. **DLC**—Evidence is presented con- cting earlier conclusions that the western shore of the northern part of the Japan Sea is d by the Liman current which arrives from the Sea of Okhotsk by way of the Nevel' Strait that the coasts of Sakhalin are warmed by the Japan current; also the interrelationship be- n thermal conditions and currents in the northern part of the Japan Sea are discussed. A led analysis is made of the monthly horizontal sea surface temperature distribution and vertical fication of water temperature in the eastern and western half of the northern part of the

Sea of Japan and of the current regime in those parts of the Sea of Japan. The annual va
of the current regime, including the effect of seasonal weather conditions, such as the mo
are analyzed in detail. It is shown that in the northern part of the Sea of Japan the vertic
horizontal stratification of temperature is determined principally by climatic causes and do
have common features with the temperature regime of the water masses of the southern h
the sea. In addition the Liman current, even if it were present, would exert practically no in
upon the physical properties of the water masses of the northern half of the Japan Sea; th
break in the relationship between the Okhotsk and Japan Sea in the Nevel' Strait practical
no effect upon the hydrological and, especially, the temperature regime of these seas. Nu
data on temperature distribution in the area under consideration and monthly charts of c
flow are presented. *Subject Headings:* **1. Temperature distribution data 2. Oceanic cu
3. Ocean water masses 4. Climatic influences 5. Liman current 6. Northwest
Ocean.**—*I.L.D.*

12M–1006 551.526.64:551.465(

Moriyasu, Shigeo (*Kobe Marine Obs.*), **Attempt to forecast oceanographic conditions
of Honshu.** *Oceanographical Magazine,* Tokyo, 9(1):35–42, Sept. **1957.** 6 figs., 3 tables,
DWB, DLC—This paper discusses the fluctuation of the Kuroshio and the cold water
which considerably influences the oceanographic conditions in the Kuroshio region south of H
In this connection water temperature in the 100 m layer off Shionomisaki, and depression
sea surface and upwelling in the cold water region are studied. In the light of these data
serial correlation coefficients, a statistical forecasting method is proposed. It is regarde
requisite, however, to have a knowledge of the characteristic conditions of each region. T
are also graphically represented. *Subject Headings:* **1. Ocean current forecasting
welling 3. Shionomisaki, Japan 4. Northwest Pacific Ocean.**—*I.S.*

12M–1007 525.63:55

Nakano, Masito, **Tidal current in the Simonoseki Straits and its prediction.** *Jou
Geography,* Tokyo, 58(6/7):213–217, **1949.** 5 figs., 4 tables, 4 refs. In Japanese; Englis
mary p. 216–217. **DLC** (Orientalia)—The presence of a tidal current in a narrow str
be inferred from the tides at both ends of the strait. That is, h being the difference of he
sea surface at both ends, the velocity of tidal current, v, at a point within the strait is ex
by the formula: $v = c\sqrt{2gh}$, where c is a constant such that $0 < c < 1$, and g is the acce
due to gravity. The turn of the current, or the slack water, lags behind the time of h, be
zero by some quantity peculiar to the point. With these concepts, the characteristics
tidal current in the Shimonoseki Straits were described, and prediction was made of a tidal
at a point in the middle part of the strait, and it showed a good agreement with actual obser
Subject Headings: **1. Tidal currents 2. Shimonoseki Strait, Japan.**—*K.C.*

12M–1008 551.501.5:518.3:525.63:551.46

Nomograms computing Takashio. *Journal of Oceanography,* Kobe, Japan, Ser. 2,
7–8, Jan. **1959.** 4 figs. In Japanese. **DLC**—A nomogram of high tidal ranges was ma
the aid of data obtained in Osaka Harbor from 1928–1954. Some of the meteorological in
on the tidal range are explained. *Subject Headings:* **1. Tidal nomograms 2. Osaka
Japan.**—*K.C.*

12M–1009 551.465.5:535.34:551.463

Sasaki, Tadayoshi (*Tokyo Univ. of Fisheries & Sci. Res. Inst.*); Okami, Noboru;
Gohachiro and Watanabe, Seichi (*all, Sci. Res. Inst., Tokyo*), **Spectral energy distribu
submarine daylight off Kii Peninsula.** *Records of Oceanographic Works in Japan,*
Special Number, No. 2:120–127, March **1958.** 6 figs., 6 tables, 6 refs., 3 eqs. **DW**
estimate the basic production of seawater it is necessary to know the effective energy of su
daylight which crosses the euphotic zone and becomes one of the main environmental fa
photosynthesis of phytoplankton. If the absorption coefficient in various wave lengths is
the effective energy used for photosynthesis at any depth can be calculated from the ab
coefficient and the spectral energy distribution. But until the relationship between the
photosynthesis and radiant energy at different wave lengths becomes accurately explainab
energy in the energy spectrum of submarine daylight or that of visible part only should
sidered as effective energy. So if the spectral energy distribution of submarine daylight is
the effective energy at any given depth can be obtained by calculating the area enclosed
base line and the curve of spectral energy distribution which is expressed in absolute
When using radiometric units the effective energy is expressed in ergs per unit surface
time, for example, ergs/cm^2/sec or g.cal/cm^2/hour. Among reports on photosynthesis by

have already been published, there are some reports that effective radiant flux is limited to ous flux and effective energy is expressed in Lux, unit of illumination. To compare our vith those of the reports previously published it is necessary to express the results of meas- daylight by two units, radiometric and photometric. There is no simple formula, which is l between these two units. If the spectral energy distribution (absolute values) is known, nation is calculated from this distribution and the absolute luminosity. In relation to the igation of oceanic productivity in the vicinity of Kii Peninsula, the measurement of day- in the sea was carried out in November 1956 at several stations off the Peninsula. By using ta of the observations the spectral energy distribution within the range of wave lengths from to 700 μ at several depths at each station is determined. Using the spectral energy distribu- the value of energy in the visible part of the spectrum incident on the horizontal surface and nation at different depths are calculated. *Subject Headings:* **1. Spectral energy of sub- e daylight 2. Photosynthesis of phytoplankton 3. Kii Peninsula, Japan.**—*Authors' ct.*

2M–1010 551.465.5:551.466.7:525.6(521.16)

i, S., **On the tide of Onahama Harbor.** *Journal of Meteorological Research*, Tokyo, 8(3): 77, March **1956.** fig., 12 tables. In Japanese. **DWB, DLC**—Using Fuess tide gauge the vation took place at the tide well; inside diameter 0.6 m, depth of iron-concrete pipe 3 m, pipe 10 m long (conduct water pipe), placed between 35°56′N and 140°54′E. Monthly ow tide and its variation during 1951–1954 were calculated by both the above method and . and are shown in tables. Average tidal variations for four years are 1.394 m, the highest in September, the lowest 1.286 in March, and the variation between the two is 20 cm. The h tide in the region of Jyoshi and of Ahikawa near Onahama only for one year of 1951 abulated on a basis of variation of six-hour, eight-hour, half day, and daily tide and the span l-tide in Ahikawa was about 22 minutes late and 5 minutes late in Jyoshi compared with ama; in the variation of big-tide 2.9 cm small in Onahama and 5.6 cm in Jyoshi comparison Ahikawa; in the small-tide the variation is 1 cm in Onahama and 2.4 cm in Jyoshi. *Subject ngs:* **1. Tide studies 2. Onahama Harbor, Japan.**—*K.C.*

2M–1011 551.466.7:525.63:551.465.5(521.26)

eki, S., **On the tide of Kawasaki Harbor.** *Journal of Meteorological Research*, Tokyo, 298–300, June **1957.** 3 refs. In Japanese. **DWB, DLC**—The location of tidal station 45′E, 35°31′N) and its development from the early part of 1931 is briefly described. This deals only with the period of 1955–1956. The use of Fuess tide gauge and the T.I. method . T. Doodson) of harmonic analysis is explained. The results shown in tables are as s: mean monthly tide level of Kawasaki; mean water level of Tamagawa River at flow and de; the maximum and minimum tides in 1955 and 1956, mean high and low tide in 1954–1955; $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{8}$ daily periodic tide; and lastly, neap and low tide and time of flow and conjunc- Tokyo, Haneda, and Yokohama. The results of observation are as follows: full-tide reached, ama, Kawasaki, Tokyo, and Haneda; 6 minutes from Yokohama to Tokyo at conjunction it was 12 minutes; difference of height, 6 cm from Yokohama to Kawasaki, 20 cm to , 2 cm low to Haneda. Mean tide level observations showed a maximum height in Aug. e lowest in March, and the range between them was 0.170 m, 0.251 m in Tokyo and 0.176 Yokohama. *Subject Headings:* **1. Tide heights 2. Kawasaki Harbor, Japan.**—*K.C.*

2M–1012 551.524.4:551.468.2(521)

akahashi, Tadao (*Kagoshima Univ., Kagoshima, Japan*), **Temperature and humidity pro- ver the sea.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts ers.* Issued Wash., D. C., AAAS, **1959.** p. 731–732. German summary p. 732. **DWB** 6082. I61pr)—At Kagoshima Bay during 1953–1956 observations were made of wind y, temperature, and vapor pressure at five levels up to 400 cm above the sea surface. An is of observed temperature and vapor pressure data is included. *Subject Headings:* **1. Tem- re profiles 2. Humidity profiles 3. Kagoshima Bay, Japan.**—*I.S.*

2M–1013 551.464:551.482.6(52)

amamoto, H. (*Kochi Univ.*), **Oceanographical studies on Japanese inlets, Pts. 1–10.** *ographical Society of Japan, Tokyo, Journal,* 14(1), March **1958,** 15(4), Dec. **1959.** 33 figs., les, 43 refs. In Japanese; English summaries. **DLC**—A detailed study of oceanographic ions in Urado, Susaki and Uranouchi Bays. Each of the papers reports on special aspects study as follows. **Pt. 1** (14(1):25–29, March 1958), **Discontinuous layers in Urado Bay,** with productivity of inlets which reflects characteristics of the land water, of meteorological ions and of activities in nearby cities. The Bay is found to be of the land water type.

Pt. 2 (14(3):93–97, Oct. 1958), **Diurnal variation of hydrographical condition in Urad**
In order to explain the mechanism of discontinuous layer, the circulation of chemical consti
the diurnal variation of water temperature, chlorinity, etc., are discussed. **Pt. 3** (14(4):15
Dec. 1958), **Relations between variation of chemical compositions and hydrographica**
ditions in Urado Bay. Reports measurements of chlorinity in sea and inlet waters and
how their ratio varies according to the kind of chemical element, hydrographic conditio
various characteristics of particular inlets. **Pt. 4** (14(3):159–161, Dec. 1958), **Relations b**
variations of chemical compositions and hydrographical condition in Susaki Bay.
(15(1):15–18, March 1959), **Relations between variation of chemical compositions a**
drographic conditions in Uranouchi Bay. Pt. 6 (15(1):19–22, March 1959), **On th**
sumption of dissolved oxygen in Urado Bay. Pt. 7 (15(2):61–63, June 1959), **On th**
sumption of dissolved oxygen in Urado Bay. Concludes that the consumption of di
oxygen increases inwards along the center line of the Bay and that river water may be th
cause of pollution of the inlet. **Pt. 8–9** (15(3):99–105, Oct. 1959), **Differences between**
Bay and Uranouchi Bay. Presents comparative data on manganese, chlorine, silica, ir
aluminum in bottom sediments of the two bays. **Pt. 10** (15(4):185–190, Dec. 1959), **On t**
tribution of iron and manganese in sea water in Urado Bay. Concludes that: 1) the q
of total iron ranges from 0.2 to 15.9 microgram atoms per liter, and that of manganese
6.2; 2) the distribution in bottom water varies with the topographical features of the se
Subject Headings: **1. Estuarine studies 2. Chemistry of estuarine waters 3. Japan.**

12M–1014 551.511.33:551.465.73(26):55
Watanabe, Nobuo (*Oceanog. Sec., Tokai Regional Fisheries Res. Lab., Japan*), **Hydrog**
conditions of north-western Pacific, Pt. 1. (In: *UNESCO Symposium on Physical O*
raphy, Tokyo, Oct. 1955, Proceedings, pub. **1957.** p. 87–95. 10 figs., 3 tables, 6 refs.,
French summary p. 87.) **DWB**—An explanation of the "mechanism" of the surface wat
perature changes which occurred in one decade in the southwestern region of Attu Island.
the theory of thermal equilibrium, it is concluded that lateral mixing was a negligible fac
sea fog does contribute by supplying heat to the sea surface and seems to be one of the im
factors involved in the changes. *Subject Headings:* **1. Surface water temperature va**
2. Attu Island, Northwest Pacific Ocean.—*E.Z.S.*

ATLANTIC OCEAN

12M–1015 551.526.6:551.464
†Bogdanov, D. V., **Nekotorye osobennosti gidrologicheskikh uslovii proliva Devisa,**
dorskogo basseĭna i raĭona N'iufaundlendskoĭ banki. [Certain characteristics of hydr
conditions in the Davis Strait, in the Labrador basin, and the region of the Grand
Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Institut, Trudy, No. 37:231–241, **1959.**
table, 16 refs. **DWB**—The hydrological conditions in the water basin between Greenland,
dor and Newfoundland are reviewed from American, Canadian, French and Danish source
in 16 references. Specific attention is given to temperature, salinity distribution, power
currents, their periodicity and penetration into the ocean depths, affected by the Gulf
Baffin, Labrador and other major currents. *Subject Headings:* **1. Oceanographic investi**
2. Davis Strait 3. Labrador basin 4. Grand Banks 5. North Atlantic Ocean.—

12M–1016 551.509.1(26):629.124.
Buhr, Joachim, **Wetterfunkerfahrungen der Bordwetterwarte des Fischereifors**
schiffes "Anton Dohrn" im Nordatlantik. [Radio weather transmission experiences
weather station aboard the fishery research vessel "Anton Dohrn" in the North Atlantic
Wetterlotse, Hamburg, No. 125:262–265, Dec. **1957. DWB**—Some technical information
to the radio weather services locally as well as countrywide in the international weather
is discussed. In an earlier paper (Wetterlotse 120 and 121, 1957) the region of the No
and the Barent Sea were treated. The present paper deals with the North Atlantic, Icel
Greenland. *Subject Headings:* **1. Radio weather services 2. "Anton Dohrn" 3. No**
lantic Ocean.—*W.N.*

12M–1017 551.4
Cresswell, G. M. (*Woods Hole Oceanog. Inst., Mass.*), **Quasi-synoptic monthly hydr**
of the transition region between coastal and slope water south from Cape Cod, Mass.
national Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.
Wash., D. C., AAAS, **1959.** p. 539. **DWB** (551.46082. I61pr)—Previous work has sh
the cold coastal water forms a continuous summertime "wedge" on the continental shelf a
from Cape Hatteras to Georges Bank. Monthly cruises were conducted from May

ptember, 1958, in the area of the cold wedge south from Martha's Vineyard and Nantucket, to vestigate variations in the position and morphology of the temperature and salinity gradients tween the coastal and the slope water. Closely-spaced hydrographic stations and bathythermoaph lowerings indicate maximum gradients in this coastal-slope water transition region of 1.0‰ five meters, and 10°F per five feet. The volume of cold coastal water decreases with the vancing season, being in September about one-fifth of that in May. In June and July the cold astal water extends relatively far southward into the slope water, indicating that bubbles of d coastal water calving into the slope water may be quite large in the early summer. The ssibility of tidal pumping as a mechanism for calving of cold coastal water bubbles is suggested U. S. Coast and Geodetic Survey bathythermograph data, taken bi-hourly at the edge of the elf south of Georges Bank, which show periodic variations every 24 hours. *Subject Headings:* **Slope water characteristics 2. Coastal-slope water transition regions 3. Georges Bank North Atlantic Ocean.**—*Author's abstract.*

12M–1018 551.465(261)

Defant, A., **Il problema della corrente del Golfo.** [Problem of the Gulf Stream.] *Asiazione Geofisica Italiana, 7th, Rome, Nov. 1957, Atti,* pub. Rome **(1958?).** p. 17–31. 21 figs., refs., 9 eqs.—After reviewing the more prominent works and theories on the Gulf Stream, the thor discusses his theoretical model involving the concept of the barotropic equivalent. Maps d illustrations from earlier and recent work on the course of this stream show its mean position d daily fluctuations, meandering, foliation, vertical density profiles and give a comparison with N. Pacific circulation. *Subject Headings:* 1. **Gulf Stream variations 2. North Atlantic cean.**—*W.N. and M.R.*

12M–1019 551.465.46(264)

Emilsson, Ingvar (*Inst. Ocean. Univ. Sao Paulo, Brazil*), The **coastal and shelf waters off uthern Brazil.** *International Oceanographic Congress, 1st, N. Y , 1959, Preprints of abstracts papers.* Issued Wash., D. C., AAAS, **1959.** p. 688–689. In English and French. **DWB** 51.46082. I61pr)—The data collected on three oceanographic cruises undertaken in 1956 indie that the main branch of the Brazil Current flows southward along the continental slope where reaches maximum velocity, and further, that a well defined limit is found between the warm and ine tropical water from the north and that situated over the central part of the shelf. This especially the case during the summer months (October–March). Below, the Brazil Current ter of lower salinity and temperature shows up. This watermass is formed near the western tremity of the Subtropical Convergence where it sinks and flows northward to reappear near at the surface in an area between the lighter, south-flowing, tropical water, and the coastal ter. Such a distribution of density across the current is to be expected in view of the dynamics ocean currents. There are, however, evidences which indicate the occurrence of upwelling om moderate depths, in particular near Cabo Frio where the prevailing winds from NE drive the rface waters offshore. It is further suggested that the upwelling is maintained by a thermoline mechanism as the density of the cold and low-salinity water is decreased by heating from ar radiation. In order to maintain dynamic stability, the heated water must, consequently, w out of the area and be replaced by water from below which in turn suffers the same decrease density, and so on Such a mechanism might, together with prevailing winds, be responsible permanent or periodic upwelling near other regions in the tropical and subtropical zone of oceans where salinity decreases with depth. *Subject Headings:* **1. Ocean currents 2. Brazil rrent 3. Upwelling 4. South Atlantic Ocean.**—*Author's abstract.*

12M–1020 551.526.6:551 464:551.465.62(261.3)

Hela, Ilmo (*Inst. of Marine Res., Helsinki*), **A hydrographical survey of the waters in the and Sea.** *Geophysica, Helsinki,* 6(3/4):219–242, **1958.** 15 figs., 5 refs., eqs. **DWB, DLC**— effort is made to survey hydrographically the waters in a limited sea area, in the Åland Sea, ing a transitional basin between the Gulf of Bothnia and the Baltic Sea proper. By means of rather high number of practically synoptic data, the different water types could be determined. e salinity data were used to show the surface currents and also the deep currents. The pattern surface currents proves more complicated than previously assumed. A distinction is made ween the discontinuity layers of temperature and salinity. An exceptionally high degree of bility is encountered where the summer thermocline and the maximum vertical gradient of salinity me together. Along the eastern edge of the Åland Sea warm water intrusions are observed wing downhill along the isopycnic surfaces below the thermocline but above the minimum temrature layer. Finally, the degree of lateral mixing is estimated. *Subject Headings:* **1. Temrature of sea water 2. Salinity of sea water 3. Åland Sea.**—*Author's abstract.*

12M–1021 551.465(

Iselin, Columbus O'Donnell (*Woods Hole Oceanog. Inst.*), **The Gulf Stream System.** *Am*
can Philosophical Society, Philadelphia, Proceedings, 96(6):660–662, Dec. 20, **1952.** 11 r
(*Woods Hole Oceanographic Institution, Contribution* No. 612, **1952**) **DLC** (Q11P5), **DW**
Describes research done on the Gulf Stream System. Three different approaches have been
lowed. The first was the statistical approach limited to surface observation. The second appro
employed in the 1930s concentrated on cross sectional observation of temp. and salinity down
depths of 2000 m or more. After World War II greatly improved navigation made it poss
to estimate direction and velocity of surface currents. The diving thermometer made it poss
to observe temp. down to a depth of 3000 m. The research of recent years is described in det
In 1950 a new method of observing surface currents was developed and an extensive survey
conducted employing six ships simultaneously. There is still plenty of research to be done in o
to understand the Gulf Stream. *Subject Heading:* **1. Gulf Stream System.**—*A.H.K.*

12M–1022 551.463/4(2

*Lauzier, L. M. and Campbell, N. J. (*both, Fish. Res. Board, New Brunswick, Cana*
Comparison of some oceanographic features in the Labrador Sea and Davis Strait regi
1928–1935 and 1950–1955. *International Oceanographic Congress, 1st, N. Y., 1959, Prepr*
of abstracts of papers. Issued Wash., D. C., AAAS, **1959.** p. 103–104. In English and Fre
DWB (551.46082. I61pr)—A study of the July and August water conditions of the upper st
in the Labrador Sea and Davis Strait has been made for two periods, 1928–1935 and 1950–1
The observations for the period 1928–1935 are based on the results of the "Marion," "Gen
Greene" and "Godthaae" expeditions, and those for 1950–1955 from data gathered by Denm
France, Germany, United States, and Canada. The salinity and temperature observations
both periods of study were averaged by degree squares for three depths: surface, 100 m and
m. A comparison of the distributions of the averaged temperatures and salinities for 1950–1
against those of 1928–1935 reveals a number of interesting features. The surface waters
Baffin Bay, Davis Strait and the northern sector of the Labrador Sea were cooler in 1950–1
than in 1928–1935. The southern sector of the Labrador Sea, however, showed an increas
temperature. Differences of surface salinity for the two periods are small but on the who
decrease of salinity from 1928–1935 is evident for 1950–1955. Lower temperatures and salin
also occurred at 100 and 200 m throughout most of Davis Strait and the Labrador Sea. At t
depths, however, the differences of temperature and salinity are small compared with the sur
variations. The changes of temperature and salinity that have taken place in these waters ap
to be the result of a number of interrelated phenomena, variations in the intensity of the curr
the distribution of Arctic ice, and atmospheric conditions. *Subject Headings:* **1. Tempera**
data 2. Salinity data 3. Arctic ice 4. Davis Strait 5. Labrador Sea.—*Authors' abst*

12M–1023 551.465(984):551.5

Lee, Arthur and Hill, H. W. (*Fisheries Lab., Lowestoft, Eng.*), **Seasonal variations in**
flow of the Gulf Stream system in relation to the atmospheric circulation. *Internat*
Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers. Issued Wash., D
AAAS, **1959.** p. 805–806. German summary p. 806. **DWB** (551.46082. I61pr)—Observat
were made of a section across the West Spitsbergen current, west of Bear Island, on board
Research Vessel "Ernest Holt," during 1949–56. The observations were employed in establis
a correlation between the volume transport of the current above 50 m depth and the south
wind component during the preceding period. The results show that fluctuations in the pos
of the Arctic front cause both short period and seasonal changes in the strength of the cu
system in the Norwegian Sea. *Subject Headings:* **1. Gulf Stream seasonal variations 2.**
Spitsbergen current 3. Arctic front influences on currents 4. Norwegian Sea.—*I.S.*

12M–1024 551.465.43(2

Lee, Arthur (*Fisheries Lab. Lowestoft, Eng.*), **Some observations on the structure of**
west Spitsbergen current. *International Oceanographic Congress, 1st, N. Y., 1959, Prep*
of abstracts of papers. Issued Wash., D. C., AAAS, **1959.** p. 408–409. German summa
409. **DWB** (551.46082. I61pr)—The work of Helland-Hansen, and more recently tha
Krauss, is cited with regard to the frequent occurrence of large undulations in the equilin
vertical sections in the Norwegian Sea. They regard internal waves as being the main
of the undulations. In contrast, observations made by the author from the "Ernest Holt
May 1958, in the West Spitsbergen Current to the west of Bear Island, show that the undula
are probably due to vortices of a few miles in diameter. A brief description of these observa
is given. *Subject Headings:* **1. Oceanic currents 2. West Spitzbergen Current 3.**
wegian Sea.—*I.S.*

12M–1025 551.461.2(261.3)

*Lisitzin, Eugenie, **Vedenkorkeusarvoja 1953 Ja 1954 vattenstond-svärden 1953 och 1954.** ater level records for the years 1953 and 1954.] *Finland. Merentutkimuslaitos, Julkaisu,* 176, **1957.** 102 p. map, 4 tables plus numerous tables in appendix. English summary p. 16. o his records for **1955–56** and **1957.** *Ibid.,* No. 180 and 184, both **1958.** 102 and 59 p. /B—This paper contains the results of water level observations made on the coast of Finland ing the years 1953 and 1954. Observations were made regularly at 13 tide gauge (mareoph) and 11 tide pole (pegel) stations. The observation stations are shown on a map, the gauge ions being marked by circles and the pole by triangles. The grouping of the observation erial is given in the water level tables. From the tide gauge records, values have been taken 6 hours daily (2h, 6h, 10h, 14h, 18h, and 22h East-European time, corresponding to Greenwich h), and besides, the monthly and annual means as well as the corresponding extreme values. monthly and annual extreme values for the tide gauges, have been taken directly from the ginal registrations. The pole observations are expressed as mean values only. The material been rearranged according to the principles put forward in the papers No. 15, 19, 29, 36, and of the Institute of Marine Research. All the water level values have been assigned to a erence level lying 200 cm under the mean water level for the epoch 1921.0. All water level ticulars are given in cm. The monthly extreme values are underlined, interpolated values and n otherwise less exact ones are printed in parenthesis. The daily and monthly mean values, the calculation of which interpolated or otherwise less exact values constitute more than 10% all values, are given in parenthesis, too. *Subject Headings:* **1. Sea level data 2. Gulf of land.**—*Author's abstract.*

12M–1026 551.465.55(261.3)

Lisitzin, Eugenie (*Inst. of Marine Res., Helsinki*), **Determination of the current velocity the Kvark on the basis of sea-level records.** *Geophysica, Helsinki,* 6(3/4):299–307, **1958.** , table, 10 refs., 3 eqs. **DWB, DLC**—Starting from sea-level records in the Bothnian Bay current velocity in the region of the Kvark for a number of selected cases with a more or pronounced water transport is determined with the aid of three different methods: 1° the nsversal component of the surface slope (Coriolis' slope) in the Kvark, 2° the changes in mean -level in the Bothnian Bay, and 3° the wind stress caused piling-up of the water in the latter area. In spite of a considerable number of deviations the correspondence is, on the average, sfactory. *Subject Headings:* 1. **Current velocity determination 2. Sea level variations Water surface slope 4. Kvark, Baltic Sea 5. Gulf of Bothnia.**—*Author's abstract.*

12M–1027 551.462:551.526.64:551.464(261.3)

Mosby, Håkon, **Renouvellement des eaux profondes dans la mer de Norvège.** [Renewal the bottom water of the Norwegian sea.] (In: France. Centre National de la Recherche entifique, **La topographie et la géologie des profondeurs océaniques.** Paris, 1959. p. 15– 14 figs., eqs. English summary p. 15.) **DLC** (GC83.F7)—The continuous renewal of the antic water in the surface layer, and the annual renewal of the bottom water as suggested by NSEN, are expressed by a differential equation, the solution of which is in concordance with observed vertical distribution of temperature. A similar explanation of the observed vertical ribution of salinity is obtained by introducing also an advective process of renewal of the p water layers. From this theory certain conclusions are drawn as to annual and year-to-year iations of temperature and salinity of the deep water. These conclusions are corroborated by ervations from Weather Ship Station M in 66°N, 2°E. If a value of the eddy conductivity of the eddy diffusivity of $A = 2$ cgs-units is adopted, the renewal by bottom water formation ound to be 27 m per year and the advective renewal to be 14% per year. *Subject Headings:* **Bottom water renewal 2. Norwegian Sea.**—*Author's abstract.*

12M–1028 551.326.7:551.468(480)

*Palosuo, Erkki, **Jääpeitteen Laajuuksien Vaihtelu Vuosina 1931–56 Etäisyydet suomen amista Jään Reunaan.** [The extent of the ice cover at the harbors on the Finnish coasts.] *land. Merentutkimuslaitos, Julkaisu,* No. 173. **1957.** 40 p. almost entirely tables, **DLC** Extensive tables of ice cover data for 17 important harbors on the Finnish Coast for period 1–1956. Extent of cover (if any) in nautical miles at intervals of five days from October 30 February 27 are given for each year. Data are based on records of the Institute of Marine search, and these are compiled from reports of harbor authorities, icebreakers, merchant marine s and air reconnaissance mean and median values are computed for 20 winters (1934–1953). list of harbors is arranged in geographical order from north to south and thence to east ent of total ice and extent of thick ice (> 4″ thick) are given for each date. A final table gives dates of departure and arrival of last and first merchant ship in fall and spring, respecti *Subject Headings:* **1. Ice cover data 2. Finnish Coast.**—*M.R.*

12M–1029 551.465.55(

†Saelen, Odd H. (*Inst. of Geophysics, Univ. of Bergen*), **Studies in the Norwegian Atla current, Pt. 1, The Sognefjord section.** *Geofysisk Publikasjoner,* Oslo, 20(3), March 28 p. 11 figs., 4 tables, 34 refs., 7 eqs. **DWB, DLC**—Observations collected in the so-c Sogne Fjord section during the years 1947–53 have been subjected to dynamical treatment. results of transport computations for 27 sections, all of them taken during the months N August, are presented. It appears that very great transport variations occur, even between tions taken at an interval of a few days. In order to obtain a better understanding of the res the theory of the dynamic computations is surveyed, with special emphasis on the case wh section extends into shallow water. It is suggested that the computed transport variations may all be real, but that they may partly be explained by varying currents at the reference (z surface. Some special features of the sections with dynamical significance have also been discu In the last chapter, a short exposition of the dynamics of the shelf waters is given. *Su Headings:* **1. Oceanic currents 2. Shelf water dynamics 3. Norwegian Atlantic Cur 4. Norwegian Sea.**—*Author's summary.*

12M–1030 551.46(2

*†Selitskaia, E. S., **Osnovnye cherty gidrologicheskogo rezhima Severnogo moria.** [outline of the hydrologic regime of the North Sea.] *Moscow. Gosudarstvennyĭ Okeano cheskiĭ Institut, Trudy,* No. 39, **1957.** 62 p. 23 figs., 27 tables, 59 refs. **DLC**—A monog devoted entirely to an analysis of current, temperature, salinity, density, water masses and characteristic data for the North Sea obtained from expeditions (surveys) and from liter sources, with special emphasis on use for fisheries and other scientific and practical purposes. physical and geographic conditions (depth, bottom relief, water exchange, climate, radiation ance, etc.) are first analyzed in some detail and then the hydrological regime (currents, tem ture, salinity, density, and water masses) treated at great length with numerous charts, sections, gradient diagrams, tables, etc., by way of illustration. A good bibliography of 9 Ru and 50 non-Russian sources is appended. *Subject Headings:* **1. Oceanographic survey of Sea 2. North Sea.**—*M.R.*

12M–1031 551.465

Swallow, J. C. and Worthington, L. V., **The deep countercurrent of the Gulf Strea South Carolina.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abs of papers.* Issued Wash., D. C., AAAS, **1959.** p. 443–444. French summary p. 444. (551.46082. I61pr)—This is a description of the investigations carried out to determine the of the level of no motion in the Gulf Stream by means of direct measurement and the geostr equation. In March 1957, the R.R.S. "Discovery II" and "Atlantis" worked together of South Carolina coast. The measurements were made with a neutrally buoyant float. The of no motion as determined by the floats, and estimates of volume transport of the deep counter rent, and that of the Florida current are given. *Subject Headings:* **1. Gulf Stream co currents 2. North Carolina Coast.**—*I.S.*

12M–1032 551.551:533.16:551.465.15

Stommel, Henry, **Lateral eddy viscosity in the Gulf Stream system.** *Deep-Sea Res* London, 3(1):88–90, Oct. **1955.** fig., table, 8 refs. **DLC**—In the analysis of 633 conse surface current measurements made by Pillsbury (1885) in the Florida Straits at 5 n intervals, velocity components, cross-products, Reynolds stresses and eddy viscosities, are puted. The purpose of the analysis is to decide whether the inertial (Morgan, 1955; Cha 1955) or the viscous (Munk, 1950) boundary layer theory is the better description of the dyn of the Gulf Stream. The eddy coefficient, estimated on the basis of this study, appears to b than one fifth of the minimum value required by the viscous theory and consequently, the in theory is a better description of the instantaneous stream in the Florida Straits. *Subject Head* **1. Current measurements 2. Eddy viscosity 3. Gulf Stream dynamics 4. Florida Str** *G.T.*

12M–1033 551.465

Stommel, Henry, **On the determination of the depth of no meridional motion.** *Dee Research,* London, 3(4):273–278, Sept. **1956.** fig., 2 tables, 6 refs., 11 eqs. **DLC**—The of no meridional geostrophic velocity is determined from a pair of hydrographic stations Sargasso Sea, on the premise that the deep flow is frictionless. Certain implications reg the eddy and advection flux of heat in the deep water are also discussed. *Subject Headings:* **1. Heat flux 2. Deep water circulation 3. Sargasso Sea, Atlantic Ocean.**—*Author's abstract.*

12M–1034 551.5:551.46(213)
Woods Hole Oceanographic Institution, **Meteorological and oceanographic research in tropical waters.** Contract Cwb-9032, Periodic Status Report for July 1–Sept. 30, 1956, issued Jan. 1957. 5 p. Also Periodic Status Report, Oct. 1–Dec. 31, 1956, issued April **1957.** 8 p. 5 refs. Appended: Ketchum, David D., **Proposed method for tracking radiosonde balloons.** 3 p. **DWB** (M(051) W898re)—The two reports present the results of observations of two cruises in the Caribbean during the above periods. The reports deal with the activities of the Crawford, cooperating in the first cruise with the PBY aircraft; with synoptic weather observations; thermistor measurements of the sea surface temperature, oceanographic observations; film records and upper air analysis. A description is given of a method which would make use of a small surface search navigation radar on the Crawford combined with a modified radiosonde transmitter on the balloon. *Subject Headings:* **1. Meteorological observations 2. Oceanographic observation 3. Caribbean region.**—*O.T.*

12M–1035 551.462(263)
Worthington, L. V., **A new theory of Caribbean bottom-water formation.** *Deep-Sea Research,* London, 3(1):82–87, Oct. 1955. 2 figs., 7 refs. Also his: **The temperature increase in Caribbean deep water since 1933.** *Ibid.,* 3(3):234–235, April **1956. DLC**—A recent section across the Caribbean Sea shows that in the Caribbean deep water oxygen values have dropped 0.3 ml/l in the last twenty years, a loss closely corresponding to that in the North Atlantic deep water. Study of the surrounding Atlantic water suggests that the Caribbean deep water has not been renewed since the end of the eighteenth century, coincident with a cold climatic variation at high altitudes in the North Atlantic. It is further deduced that the Windward Passage was the sill over which this water originally came from the Atlantic, and that both the Jungfern and Windward Passage sills must be considerably shallower than DIETRICH's (1939) estimates. According to the second note the rate of warming derived from water temperature measurements made in the Caribbean Basin in 1933 and 1954 to a depth of 3000 m indicates that the basin was cut off around 1820. *Subject Headings:* **1. Bottom water formation 2. Oxygen distribution 3. Temperature measurements 4. Caribbean Sea.**—*Author's abstract and G.T.*

12M–1036 551.46(261/264)
*Wust, Georg and Defant, A., **Die dynamischen Werte für die Standardhorizonte an den Beobachtungsstationen.** [Dynamic values for the standard depths at observation stations.] Berlin, Walter De Gruyter, **1938.** p. 99–180. fig., almost entirely tables. (*Deutsch Atlantische Expedition (Meteor), 1925–1927, Wissenschaftliche Ergebnisse,* Vol. 6, Pt. 2, Lieferung (Installment) 3) **DLC** (Z115.D448) **DWB** (508.3 D486wi)—This report contains the scientific results of the German Atlantic Expedition 1925–1927. The data are presented in tables and methods of calculating the dynamic values are explained. The data consist of density and pressure at standard depths, and the specific volume and depth of isobaric surfaces at standard pressure. A map containing ship routes and stations of the "Meteor" is included. *Subject Headings:* **1. German Atlantic Expedition 2. Oceanographic data 3. Atlantic Ocean.**—*E.Z.S.*

BALTIC SEA

12M–1037 551.464(261.3)
Gorshkova, T. I., **Khimicheskiĭ sostav gruntovykh rastopov Baltiĭskogo moria.** [Chemical composition of bottom solutions of the Baltic Sea.] *Akademiia Nauk SSSR, Doklady,* 113(4): 863–865, **1957.** 2 tables, 9 refs. **DLC**—Eighteen bottom samples at 6 different locations were chemically analyzed for C, Cl, Si, P. NH_4, NO_2, pH, etc. The results give some clues to the past history of the Baltic Sea. *Subject Headings:* **1. Oceanographic chemistry 2. Baltic Sea.** —*A.A.*

12M–1038 551.58:551.46(261.3)
*†Moniak, Jan, **Izochrony Morza Bałtyckiego na tle jego warunków klimatycznych i oceanograficznych.** [Isochrones of the Baltic Sea on the basis of its climatic and oceanographic conditions.] *Acta Geophysica Polonica,* Warsaw, 7(3/4):367–390, **1959.** 11 figs., 9 tables, 34 refs. **DWB, DLC**—In spite of the fact that the Baltic Sea is one of the smallest in the world the navigational conditions of the sea are rather difficult to explain. This is due to sharp climatic and oceanographic differences caused by its extension in a meridional direction and its location in the confines of the boreal and subarctic climatic zones and its extension over a distance of 1700 km from south to north. The author discusses the climatic and oceanographic features of the

sea supplemented by numerous graphs and tables showing the mean monthly air temperature vari tions, the number of frosty, foggy and stormy days, the frequency, force of winds and its dire tion, the duration of ice phenomena, the prevailing sea currents and the distribution of deep ar shallow waters in different parts of the sea. The paper includes a map of navigation isochron of the Baltic Sea. *Subject Headings:* **1. Oceanographic conditions 2. Climatic conditio 3 Baltic Sea.**—*A.M.P.*

12M–1039 551.464(261.

Soskin, I. M., **Soleobmen cherez datskie prolivy i ego vliianie na mnogoletnie kolebani solenosti Baltiĭskogo moria.** [Salt exchange through the Danish channels and its effect long-period salinity variations in the Baltic Sea.] *Moscow. Gosudarstvennyĭ Okeanograficheski Institut, Trudy,* No. 37:34–41, **1959.** 4 figs., table, 5 refs. Russian summary p. 41. **DWB-** The study of the salinity variations during 1920 to 1939 indicates that the salinity is increasi in the Baltic Sea due to water exchanges through the Danish Channel. The effect of averag monthly and yearly variations in the water exchange is graphically connected with the salini variation and the character of the atmospheric circulations above the North Atlantic and Europ *Subject Headings:* **1. Salinity variations 2. Atmospheric circulation 3. Baltic Sea.**—*N.P.*

12M–1040 551.465.1:681.14:621.

Svansson, Artur (*Fishery Board of Sweden, Gothenburg*), **Some computations of wat heights and currents in the Baltic.** *Tellus,* Stockholm, 11(2):231–238, May **1959.** 14 figs., refs. **DWB, DLC.** Abstract in: *International Oceanographic Congress, 1st, N. Y., 1959, Pr prints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 706–709. fig., eqs. Ge man summary p. 709. **DWB** (551.46082. I61pr)—The Skagerack, the Kattegatt, the Dani Sounds and the Baltic, all together here called the Trans-Baltic, are treated as a one-dimension channel with homogeneous water. Water heights and velocities are computed from the line hydrodynamical equations, including terms of acceleration, wind stress, air pressure and frictio It is made numerically with help of the electronic computor BESK. The computations are main concentrated to a case 5/12–12/12 1932. The same treatment is also made for a closed bas consisting of the Baltic proper + the Gulf of Finland, altogether here called the Eastsea. *Subje Headings:* **1. Hydrodynamical equations 2. Water heights 3. Baltic Sea 4. Gulf of Finlan** —*Author's abstract.*

12M–1041 551.526.6:551.464(261.

Wojnicz, Bogusław (*Zaklad Oceanog. PIHM, Gdynia*), **Z wyników obserwacji nad te peratura i zasoleniem Bałtyku w okresie VIII 1957–V 1958.** [Some results of observation temperatures and salinity of the Baltic. Aug. 1957 to May 1958.] *Przeglad Geofizyczny,* Wa saw, 4(3/4):199–206, **1959.** 8 figs., table. **DWB, DLC**—Methods and results of systemat observations of the temperature and salinity of the Baltic Sea organized by the Oceanograph Institution of PIHM at 8 sea stations on the route Ustka (Gulf of Gdansk (Danzig)) a Karlsham (Swedish coast) between Aug. 1957 and May 1958 are presented and discusse Several tables and graphs illustrating the results that were obtained show the water temperatu and salinity in the upper and lower layers of the Sea at the Polish and Swedish coasts. *Subje Headings:* **1. Temperature observations 2. Salinity observation 3. Baltic Sea.**—*A.M.P.*

MEDITERRANEAN SEA

12M–1042 551.579:551.465(261,26

Tchernia, P. and Lacombe, H. (*both, Museum of Oceanog. and Physics, Paris*), **Hydrologic cycle in the Mediterranean.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprin and abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 520–522. fig. In English a French. **DWB**—The process by which the surface water of the Atlantic type entering t Mediterranean is changed into deep water of Mediterranean type is analyzed. The transformati process is different in different parts of the Mediterranean and is explained separately. A di gram showing this hydrological cycle in the Mediterranean is also included. *Subject Heading* **1. Hydrologic cycle in the Mediterranean Sea 2. Mediterranean Sea.**—*I.S.*

12M–1043 551.46(26

Bougis, P.; Ginat, M. and Ruivo, M., **Recherches hydrologiques sur le Golfe du Lio** [Hydrological research on the Gulf of Lions.] *Vie et Milieu,* Paris, 7(1):1–18, **1956.** 15 fig (*Actualités Scientifiques et Industrielles,* No. 1249, pub. Paris, Hermann, **1956**). **DLC** (Q111.A Data and charts show the results of oceanographic surveys made along sections in the Gulf Lions from May 10–13, 1954. The surface currents, salinity, temperature, etc. are discussed a the effect of the Rhone considered. Charts show surface conditions as well as conditions to 40 lepth (in some places). Depth waters in the western portion and near the surface in the north nd northwest portions are cold and have a salinity 737.9‰, whereas in the southeastern portion he waters are warmer. The fresh water from the Rhone stays in the top 10 m. *Subject Headngs:* **1. Oceanographic survey of Gulf of Lions 2. Gulf of Lions.**—*M.R.*

ARCTIC OCEAN

12M–1044 551.462:551.465(268)

Balakshin, L. L., **Tsirkuliatsiia vod i rel'ef dno severnoi chasti Grenlandskogo moria.** [The water circulation and relief of the northern part of the Greenland Sea.] *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS, **1959.** p. 430–431. **DWB** (551.46082. I61pr)—The north part of Greenland Sea was studied for solving basic problems of water and heat exchange between the Arctic basin and the North Atlantic. The relief of the ocean floor was studied by Soviet expeditions in 1956, 1957 and 1958. It was established that a submarine ridge, called Nansen Threshold, between Spitzbergen and Greenland, does not exist, but a trough with depths over 2700–3500 m was observed. The data make it possible to chart an accurate scheme of water circulation, based on hydrologic mapping north from 78°N latitude, between Greenland and Spitzbergen, and to prepare a new bathymetric chart. *Subject Headings:* **1. See bottom topography 2. Sea water circulation 3. Greenland Sea.**—*S.N.*

12M–1045 551.46(268)

†Buinitskiĭ, Viktor Kharlampievich (*Leningrad*), **O niektórych wynikach nainowszych badán oceanograficznych w Basenie Arktycznym.** [Some results of most recent oceanographic studies in the Arctic basin.] *Przegląd Geofizyczny,* Warsaw, 3(3/4):249–274, **1958.** 12 figs., 2 tables, 25 refs. **DWB, DLC**—The research in oceanography and geophysics was conducted by 7 Soviet drifting stations (on more than 400 points) in the Arctic. The review presents data on (1) morphology and geological history of the Arctic region; (2) water from the Atlantic and deep layer water; and (3) ice drifting in the Arctic. Bibliography has 25 entries to which reference is made in the text. Nine of the figures are maps, three are diagrams. *Subject Headings:* **1. Oceanographic investigations 2. Arctic Ocean.**—*P.T.L.*

12M–1046 551.507.2(268)

Churkina, N. A., **Dreĭf buev Tsentral'noĭ Arktike i v arktichesikh moriakh.** [Drift of buoys in the Central Arctic and in Arctic seas.] *Problemy Severa,* Moscow, No. 1:337–340, **1958.** fig., 2 tables, 4 refs. **DLC**—Information on the finding of buoys launched in Arctic seas from expeditionary vessels during the last five years, showing the number of the buoy, the name of the vessel, the launching date and site and the date and site of their recovery is presented in a table and in a chart showing the probable trajectories of the buoys. It shows that some of the buoys have apparently drifted in the confines of the given sea, while others have made a long voyage and were carried out through the central part of the Arctic into the Northern Atlantic Ocean. This confirms once more the accuracy of the presently accepted scheme of ice drifts in the Arctic Basin and the adjoining seas. *Subject Headings:* **1. Buoy trajectories 2. Ice drift 3. North Atlantic Ocean 3. Arctic Ocean.**—*A.M.P.*

12M–1047 550.3:551.46:551.5(268/98)

Cotell, Irene M. (*A. F. Camb. Res. Center*), **Arctic Ocean research.** *U. S. Air Force. Cambridge Research Center, GRD Research Notes,* No. 29, Dec. **1959.** p. 10. **DWB**—An introduction outlining the geographic area, naming the participants and giving the scope of research being done in the Arctic. In addition to research in the Beaufort Sea vicinity, ice island T_3; Ellesmere Ice Shelf; Drift Station Alpha and Bravo (T_3) were set up. Participating contractors are Lamont Geological Observatory, U. S. Geological Survey, Arctic Institute of North America, Dartmouth College, and Woods Hole Oceanographic Institution. Investigations include gravity and magnetic observations, ice studies, oceanographic observations, submarine geophysical measurements, ice movement studies, marine biological research and micrometeorological observations. *Subject Headings:* **1. Arctic Ocean research programs 2. Arctic Ocean.**—*E.Z.S.*

12M–1048 551.501.9:551.326.7:551.46:550.3(98)

Cromie, William J. (*Lamont Geological Obs., Columbia Univ.*), **Oceanographic and geophysical investigations at Arctic drifting station Charlie.** *U. S. Air Force. Cambridge Research Center, GRD Research Notes,* No. 29, Dec. **1959.** p. 16–21. 5 figs. **DWB**—Twenty-five deep sea cores, the longest measuring 99 inches were taken with a piston corer. Approximately 110 underwater photographs covered bottoms from 150 to 1400 fathoms deep and show abundant variations in fauna, some sedimentary structures and rock debris with manganese co ing. Trawls brought up abundant live specimens among which was a new species of benth copepod. Mud was collected for carbon dating. Lamont's new Precision-Depth-Recorder ma continuous soundings from the ice pack. Both the microvariobarograph and new NRM produc much data. Earthquakes and bomb blasts can be recorded by seismometers on an ice pla *Subject Headings:* **1. Arctic drifting station Charlie 2. Oceanographic investigations Geophysical investigations 4. Bomb blast detection 5. Arctic Ocean.**—*E.Z.S.*

12M–1049 551.465(26

Dobrovol'skii, A. D. and Arsen'ev, V. S., **K voprosu o techeniiakh Beringova mor** [Currents in the Bering Sea.] *Problemy Severa,* Moscow, No. 3:3–9, **1959.** fig. **DLC**—T hydrology of the Bering Sea was studied inadequately and Ratmanov's 1937 maps are s widely used. Members of the Oceanographic Institute (D. A. Drogaitsev and A. N. Gezentove made attempts by using a theoretical approach to the problems on the Bering Sea currents, a considered the effect of the turbulent tangential friction of wind on the water surface. T author does not describe this work in detail, however, he briefly outlined the application of n data of the hydrological observations made on the ships "Vitiaz" (1950–52) and "Nerpa" (195 56) for his dynamic method of coordination of mass currents in the field of winds. The dynam maps for winds at the levels 500–1000 mb, prepared on the data provided by these ships a analyzed with respect to their effect on the water surface of the southern and central portio of the Bering Sea. Final correlation of the wind effects on the current are illustrated for whole Bering Sea area and discussed in the text. Specific attention is given to the followi currents: Attu, Tanaga, St. Lawrence, Anadyr, Kamchatka and cross sea currents. *Subj Headings:* **1. Ocean currents 2. Bering Sea.**—*N.P.S.*

12M–1050 551.46(26

§Hela, Ilmo and Krauss, Wolfgang, **Zum Problem der starken Veranderlichkeit der Schi tungsverhaltnisse im Arkona-Becken.** [The problem of strong variability of the layer con tion in the Arctic Basin.] *Kieler Meersforschungen, Kiel,* 15(2):125–143, **1959.** 46 figs., 2 tab eqs. **DWB**—A report on results of quasi-synoptic research in the Arctic Basin. The report divided into five parts. The first gives a background to the research undertaken with numer references to similar studies. The next contains a description of the expedition. A general n on the hydrographic profiles is followed by an analysis of the data collected at the anchor stat H.W.47. The final section discusses the significance of seiches. Longitudinal and transve profiles are plotted to illustrate the data collected. These are compared with data from other ar Two research vessels, "Aranda" (Helsinki) and the "Hermann Wattenburg" (Kiel), cooperat The "Aranda" using a bathothermograph and the other using bathosonde gathered data and th results differ only slightly. The advantages of the use of each instrument are described. H monic analysis of temperature ranges at 22 and 30 m at the anchor station H.W.47 are inclu Weather maps of the area studied are given. The temperature, salinity and oxygen content discussed and results compared with results of a variety of other sources. *Subject Headin* **1. Oceanographic investigations 2. Arctic Ocean.**—*E.Z.S.*

12M–1051 551.463/4(26

*Hela, Ilmo and Koroleff, Folke, **Hydrographical and chemical data collected in 1955 board the R/V Aranda in the Baltic Sea.** *Finland. Merentutkimuslaitos, Julkaisu,* No. **1957.** 36 p. Also . . . **1957 on board the R/V Aranda in the Barents Sea.** *Ibid.,* No. issued **1958.** 67 p. Both, almost entirely tables. **DWB, DLC**—Results of two cruises thro the Baltic and Barents Seas (June 15–Aug. 27, 1955 and June 29–July 27, 1957) are repor Methods of measurement are described and the hydrographic, chemical, bathythermograph, face temperature and salinity data obtained are presented in extensive tables. *Subject Headin* **1. Oceanographic data 2. Baltic Sea 3. Barents Sea.**—*G.T.*

12M–1052 551.5:551.46(2

Judge, S. B., **The Kara Sea.** *Marine Observer,* London, 28(182):206–209, Oct. **1958. DLC**—The Kara Sea presents sailing vessels with many obstacles because of its magnetic ano lies and fog. The floes in the sea are influenced by the Kara Sea current and wind. Russians maintain the Kara Sea Ice Agency, which requires positions from passing vessels gives in turn, ice information. *Subject Headings:* **1. Ice floes 2. Sea fog 3. Magnetic ano lies 4. Kara Sea.**—*N.N.*

12M–1053 525.623:551.466.75(268)

Sgibneva, L. A., **K voprosu o prilivnykh techeniiakh Barentsova moria.** [Tidal currents he Barents Sea.] *Moscow. Gosudarstvennyi Okeanograficheskiĭ Institut, Trudy,* No. 46:65– **1959.** 4 figs., 3 tables, 3 refs. Russian summary p. 72. **DWB**—The characteristics of nation of tidal currents in the Barents Sea were investigated by means of a harmonic analysis he cycle of daily observations on currents. The harmonic constants of the four principle tidal es M_2, S_0, K_1 and O_1 was carried out by the Admiralty method. The verification of the har- ic constants of the projection of the four principle components of tidal waves by the con- ction of ellipses of these components and further analysis of their dimensions, orientation of large axes, direction of the vector, the vector direction of the zero hour. A comparison of ilts for the nearest points and an analysis of the calculated harmonic constants of the vector tidal flow leads to the conclusion that the harmonic constants are authentic. For further lysis of the properties of the tidal currents harmonic constants of the vector of tidal flow, by the fundamental characteristics of the ellipses of the principle components was employed. daily components were found to play a marked role in the formation of tidal currents. Over rge part of the Barents Sea the nature of the currents are not truly semidurnal. The mag- ides of both the phase and tropic inequalities are not considerable. The abnormally marked ease of the daily O_1 in comparison with K_1 is a characteristic of the tidal current. The in- ase in the semidiurnal current is calculated as 1–2 days and that of daily currents is 4–6 days. variability of tidal currents from day to day depends upon the phase and tropic inequalities. arge daily inequality is observed in velocities of currents; on individual days the tidal currents uire the character of daily currents. *Subject Headings:* **1. Tidal currents 2. Barents Sea.** *L.D. and author's abstract.*

12M–1054 551.46(268)

Timonov, V. V., **Glavnye osobennosti gidrologicheskogo rezhima Belogo Moria.** [Main racteristics of the hydrological regime of the White Sea.] In: Leonov, A. K. (*ed.*), **Pamiati ia Mikhailovicha Shokal'skiĭ.** [In memory of Iulii Mikhailovich Shokal'skiĭ.] Moscow, **0.** p. 206–235. 5 tables, 21 refs. **DLC**—Discussion of water balance of the White Sea to the narrowest section of the Strait (annual runoff from the continent 185 km^3, precipitation km^3, evaporation 13 km^3, discharge to and inflow from the Barents Sea approximately 2200 and 2010 km^3). Furthermore the influence of atmospheric pressure and winds on the hydro- c regime of the sea is discussed, as well as the effect of turbulent mixing due to convection, es, etc. A few chapters deal with currents and thermohaline structure of the sea. (*Same as* 9E8, June 1958, *Met Abs.*) *Subject Headings:* **1. Water balance of seas 2. Ocean rents 3. Marine hydrology 4. White Sea.**—*A.A.*

12M–1055 551.465(268)

Treshnikov, A. F. (*Arctic & Antarctic Res. Inst. Leningrad*), **Oceanography of the Arctic sin.** *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of abstracts of papers.* ied Wash., D. C., AAAS, **1959.** p. 522–524. In English and Russian. **DWB**—Description he bathymetry of the Central Arctic Basin based on the investigations carried out during the eleven years by Soviet high latitude air expeditions and drifting stations. The water column the basin is found to consist of three layers: surface water, Atlantic water and deep water. racteristic features of the three layers are described. *Subject Headings:* **1. Bathymetry of tic Acean 2. Soviet high latitude air expeditions 3. Arctic Ocean.**—*I.S.*

12M–1056 551.46(268)

Worthington, L. V., **Oceanographic observations.** *U. S. Air Force. Cambridge Research ter, GPD Research Papers,* No. 63, Vol. 1, Sept. **1959.** p. 31–35. 2 figs., table, ref. **DWB, C**—An account of observations in the Arctic made at a series of hydrographic stations. The rts show the temperature and salinity of the Arctic Ocean along the path of Fletcher's Ice nd, T-3. The validity of dynamic computations based on data taken at long time intervals is n to question, but in defense it can be shown that temperature variations in T-3 are small. *ject Headings:* **1. Arctic Ice Island T-3 2. Oceanographic observations 3. Arctic Ocean.** *H.K.*

ANTARCTIC OCEAN

12M–1057 551.513.2:551.515.1:551.465(99)

Ivanov, I. A., **O sezonnoĭ izmenchivosti Antarkticheskogo tsirkumpoliarnogo techeniia.** [Sea- al variations of the Antarctic circumpolar current.] *Akademiia Nauk SSSR, Doklady,* 127(1): **77, 1959.** fig., table, 3 refs., 9 eqs. **DWB, DLC**—The results of calculation of pressure gradients

along 20° east longitude between 60° and 40° south latitude from daily synoptic maps (19
explain the variations of tangential wind stress with time show, that the fluctuation of pr
gradient as well as the fluctuation of discharge indicate a semiannual period since the max
gradients of atmospheric pressure occur in the spring and fall of the southern hemisphere.
variable component of tangential wind stress is approximated by the expression

$$\tau = \tau_0 \cos(\sigma_1 y + \pi/2) \cos(\sigma_2 t + \pi/2)$$

where τ_0 = amplitude of the tangential wind stress, $\sigma_1\sigma_2$ = frequency of oscillation; $\sigma_1 = 3\pi/2$
$\sigma_2 = 2\pi/T$; where L = width of channel (60°–40° south lat.) and T = period of fluctuation
determine whether variations of tangential wind stress are the cause of the fluctuation of the Ant
circumpolar current, a simple model of the oscillations of the entire flow caused by tangential
stress is set up and the deviation of an expression for the fluctuation of the Antarctic cirum
current is presented, namely $R = \tau_0 \cos\sigma_2 t / \sigma_1\sigma_2\bar{p}$. The results of calculations show that the
retical curve is in good agreement with calculations made with the dynamic method. The gr
shift in phase between the gradient of atmospheric pressure and the fluctuations equal $\pi/2$.
expression $S_x = \tau_0 \cos\sigma_2 t \cdot \cos\sigma_1 y / \sigma_2\bar{p}$ (S_x = variable component of the enter current in the x
tion) agrees with the accepted description of the variation of the Antarctic circumpolar cu
Results of an analysis of sections made by the "Discovery" and Second Soviet Antarctic Expe
with the "Ob," showed substantial differences in the northern part of the section which st
speaking, issue beyond the boundaries of the Antarctic circumpolar current. The differen
temperature and salinity distribution between these two sections within the boundaries of the c
studied are insignificant and incomparable with seasonal variation of the hydrological character
It is shown that the Antarctic circumpolar current either does not influence long period of fluctu
or that the fluctuations have a period close to 18 years. *Subject Headings:* **1. Antarctic circu**
2. Circumpolar currents 3. Ocean current variations 4. Antarctica.—*I.L.D.*

12M–1058 91.04(99) 551:506.5:551.326.7:551.46
Kusunoki, Kou, **Preliminary report of oceanographic observation of the Japanese**
arctic Research Expedition I, 1956/1957, with the "Soya." *Antarctic Record,* Tokyo, N
32–40, March 1958. 2 figs., 4 refs. Japanese summary, p. 32–33. **DWB**—An outline of th
as well as the surface, serial and sea ice observations that were accomplished during the
mission of the Japanese Research Expedition (Nov. 8, 1956 to April 24, 1957), are disc
The results of the oceanographic observations are included in detail. Ice conditions are des
and summarized, indicating its concentration, type, and other phenomena. *Subject Hea*
1. Japanese Antarctic Research Expedition, 1956–1957 2. Oceanographic observatio
Sea ice 4. Antarctic Ocean.—*N.N.*

12M–1059 91.04(99) 551.46(26
Moroshkin, K. V., **Gidrologicheskie issledovaniia Sovetskoĭ antarkticheskoĭ eksp**
na dizel'-elektrokhode "Ob'." [Hydrological investigations of the Soviet Antarctic Expe
on board the diesel-electric ship "Ob."] *Leningrad. Arkticheskiĭ i Antarkticheskiĭ Na*
Issledovatel'skiĭ Institut, Informatsionnyi Biulleten' Sovetskoĭ Antarkticheskoĭ Ekspeditsi
3:17–18, **1958. DWB** (P. 3:1958)—The distribution of hydrologic characteristics at the
arctic parts of the Indian and Pacific Oceans were investigated. The motion and transfor
of deep water was analyzed by isopycnic methods, the currents and temperature were mar
self recorders. Observations of ice and of agitation, as well as new data on the structure
Antarctic divergence zone were reported. *Subject Headings:* **1. Hydrological investig**
2. Antarctic expeditions 3. Indian Ocean 4. Pacific Ocean.—*S.N.*

12M–1060 551.465.1
Panteleev, N. A. (*Faculty Physics, Moscow Univ.*), **Investigations of turbulence in s**
water in the Antarctic sector of Indian and Pacific Oceans. *International Oceanographi*
gress, 1st, N. Y., 1959, Preprints of abstracts of papers. Issued Wash., D. C., AAAS,
p. 417–419. In English and Russian. **DWB** (551.46082. I61pr)—The investigations were
with a "turbulimeter" which permitted the simultaneous registration of turbulent fluctuat
temperature at three slightly different depths, both the horizontal and vertical components
bulent velocity, as well as the mean values of temperature and current velocity. These me
ments were undertaken in the course of the third trip of the Marine Antarctic expedition
M.V. "Ob." The results furnish some quantitative examples of the character and struct
natural turbulent flow, the intensity of the vertical turbulent transfer processes, as well a
regularities of the distribution of these characteristics. *Subject Headings:* **1. Surface**
turbulence 2. Marine Antarctic expeditions 3. Vertical turbulent transfer 4. An
Ocean.—*I.S.*

12M–1061 551.553:551.465.15:551.326.7(267,269)

Rzheplinskiĭ, G. V., **Okeanicheskoe volnenie v Antarktike.** [State of the sea in the ntarctic.] *Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Institut, Trudy,* No. 48:5–85, **1959.** figs., 10 tables, 12 refs. 8 foot-refs. English and Russian summaries p. 84. **DWB**—This vestigation of the state of the sea in the Antarctic is based on observations, mainly during the st Antarctic run of the diesel-electric ship "Ob" in 1956, and the results of computation of wave ements and wave fields. Certain data concerning ocean waves in the monsoon and trade-wind nes of the Indian Ocean and in the region of floating ice near the Antarctic coast have been cluded. The role of roughness of the sea in the formation of the ice regime of the Antarctic discussed. Certain characteristics of the wind regime for the 90th meridian east longitude are scribed. The paper is divided into three chapters: 1) results of visual and instrumental ob- rvations; 2) computation of wave elements according to wind and certain characteristics of nd regime and waves; and 3) wave fields. The discussion is detailed and amply illustrated by arts of wave fields in the Antarctic. *Subject Headings:* **1. Ocean waves 2. Ice formation Wind regime over the ocean 4. Wave fields in Antarctica 5. Antarctica 6. Indian cean.**—*M.B.G.*

12M–1062 551.556.8:551.465.46:551.326.7(269,99)

Wexler, Harry (*U. S. W. B., Wash., D. C.*), **The Antarctic convergence or divergence?** n: Bolin, Bert. (*ed.*), **The atmosphere and the sea in motion.** N. Y., Rockefeller Institute ess, **1959.** p. 107–120. 7 figs.. 2 tables, 40 refs.) **DLC**—Bathythermograph (BT) data ailable in the past decade reveal the existence of a narrow cold core of water embedded in the ntarctic Circumpolar Current at the Antarctic "Convergence." This cold core is explained by welling of cold water from below. The upwelling itself results from horizontal divergence im- essed on the sea surface by the frictional stress of the strong winter westerly winds on the en water just north of the northern limit of the pack-ice surrounding Antarctica. *Subject eadings:* **1. Upwelling 2. Antarctic convergence 3. Antarctic Circumpolar Current 4. ntarctic Ocean.**—*Author's abstract.*

CHINA SEAS

12M–1063 551.465:551.526.6(265)

Katō, T., **Oceanographic conditions of the East China sea.** *Journal of Meteorological search,* Tokyo, 11(9):743–751, **1959.** 16 figs., 2 tables, ref. In Japanese; English summary 743. **DWB, DLC**—Oceanographical conditions of the East China Sea in winters are analyzed using the data collected between Feb. 1952 and 1959 in the following phases: 1) variation of area of the cold-water-mass and the Kuroshio; 2) variation of the cold-water-mass core and t of the Kuroshio; 3) analysis of the fluctuation of vertical cross section area of the Kuroshio l average temperatures in this area; 4) abnormal condition caused by the dry weather in the mmer of 1958 and 5) local effect on the cold-water-mass on the Kuroshio. The result of the alyses is summarized as follows: In every winter, the water fed from rivers of the China con- ent during the last summer, makes "the Yellow Sea Cold-water-mass" in the East China Sea, l makes a clear boundary with the Kuroshio. The cold-water-mass becomes homogeneous ver- ally by turbulence caused by the monsoon and the temperature fall of the surface air mass, and the same time the boundary is shifted to southeast usually and to south occasionally. The riation of the area of mixing water is proportional to the maximum velocity (mean value from surface to the 200 m at a position) of the Kuroshio. The intensity of the Kuroshio has reased in the last two years. *Subject Headings:* **1. Oceanographic conditions 2. Kuroshio rrent 3. East China Sea.**—*Author's abstract.*

12M–1064 551.463(265)

Nishizawa, Satoshi and Inoue, Naoichi, (*both, Faculty of Fisheries, Hokkaido Univ., Hako- e*), **Turbidity distribution and its relation to some oceanographical factors in the Eastern ina Sea in the late summer of 1956.** *Records of Oceanographic Works in Japan,* Tokyo, ecial Number, No. 2:101–115, March **1958.** 12 figs., 16 refs., 7 eqs. **DWB**—Several water sses were distinctly analyzed by the extinction coefficient observed using a turbidity meter of nple design. Sharp knees of turbidity occurring at the spring layer of density were noticed and plained by the sudden decrease of vertical eddy diffusivity. The existence of distinct minimum turbidity at the maximum density gradient was especially demonstrated and the development of ensive mixing in horizontal direction at the spring layer was suggested. In the oceanic ho- geneous water to the right of the Kuroshio axis, the downward transport of suspended detritus s calculated from the observed vertical distribution of turbidity and phyto-plankton production each level was also discussed. *Subject Headings:* **1. Sea water turbidity 2. Phyto-plankton oductivity 3. Eastern China Sea.**—*Authors' abstract.*

12M–1065 551.461.2:551.466.6/7(

Pukasab, Pinich and Pochanasomburana, Pravej (*both, Royal Thai Navy, Thonburi, T* *land*), **The types of tides and mean sea level in the Gulf of Thailand.** Pacific Science Cong 9th, Bangkok, 1957, **Proceedings,** Vol. 16, pub. **1958.** p. 126–130. 4 figs., 2 tables. **D** [M(06) P117p]—Description of four types of tides and mean sea level in the Gulf of Thail Studies of tide have been made here since 1916. Observations of mean sea level and variat in mean sea level are reported. Seiche motions recorded by a tide gage at Prachuap Khirik Jan. 2 to 3, 1955 are described. *Subject Headings:* **1. Tidal studies 2. Sea level variat 3. Seiches 4. Gulf of Thailand.**—*E.Z.S.*

12M–1066 551.46:06(

Serène, R. and Nguyen, Van-Hai (*Inst. Oceanographique de Nhatrang, Viet-Nam*), **cherches d'océanographie physique au Viet-Nam.** [Research in physical oceanography in Nam.] (In: UNESCO Symposium on Physical Oceanography, Tokyo, Oct. 1955, **Proceedi** pub. **1957.** p. 214–219. fig. In French; English summary p. 214). **DWB**—A summary of findings of the general characteristics of the circulation of the China Sea area. The Gul Tonkin and the Gulf of Siam are characterized as having halothermic heterogeneity. The eas coast of Viet-Nam is subject to the northern monsoon, having a cold north-south curren winter and the southern monsoon in summer with a warm south to north surface current. *Su* *Headings:* 1. **Ocean circulation 2. China Sea 3. Gulf of Tonkin 4. Gulf of Thailan** *E.Z.S.*

INDIAN OCEAN

12M–1067 551.465(

*Tchernia, P.; Lacombe, H. and Guibout, P., **Sur quelques nouvelles observations hy logiques relatives à la région équatoriale de l'Océan Indien.** [Some new hydrological obse tions relative to the equatorial region of the Indian Ocean.] *France. Comité Central d'Oce graphie et d'Etude des Côtes, Bulletin d'Information,* 10(3):115–143, March **1958.** 13 figs., t 8 refs. **DWB, DLC**—Various oceanographic cross-sections made in the western Indian O by John Murray Expedition 1933–34, the "Norsel I" and "II," Nov. 1955–Feb. 1956; the " tross" in 1948, and "Discovery II" in 1951, are presented and discussed, with special emphasi the stations occupied by the "Norsel I" and "Norsel II," and on the dynamic structure of cur of the North Equatorial section of the Indian Ocean. These meridional cross sections were mainly in the winter monsoon or inter-monsoon (April) seasons and none were made in summer monsoon. Charts show location of intermediate Antarctic waters, and of subtro waters of maximum salinity. *Subject Headings:* 1. **Ocean currents, Indian Ocean 2. In Ocean expeditions 3. Intermediate Antarctic waters 4. Northwest Indian Ocean.—**

MISCELLANEOUS

12M–1068 551.46(

Groves, Gordon W. and Reid, Joseph L., Jr., **Estudios oceanográficos sobre las aqua Baja California.** [Oceanographic studies of the waters of Baja, California.] *California.* *Scripps Institution of Oceanography, Contributions,* 1958, issued **1959.** p. 997–1031. 9 figs refs. [Oceanographic studies on the waters of Lower California.] "Reprinted from the *greso de Historia Regional, 1st, 1958 (Mexico?), Memoria Mexicala,* p. 89–121." DWB (5 C153co 1958)—A descriptive paper reporting the oceanographic studies on the waters off California. The major part of these studies have been carried out by CCOFI which starte program in 1949. The program was actually started to study sardine, but later included st of other species of fish of commercial importance. For this purpose, monthly sea voyages been taking place since 1949. Two to four ships participate in the voyage, visiting the e network of hydrographic stations. At each station samples of sea life and of water are coll and various investigations concerning water temperatures, content of oxygen, salinity, de measurements of the current, etc. are carried out. Numerous graphical representations illus the discussion. *Subject Headings:* **1. Oceanographic studies 2. Fisheries 3. Baja Califo Mexico.**—*I.S.*

12M–1069 551.46(

Roden, Gunnar I. and Groves, G. W. (*both, Scripps Inst., La Jolla, Calif.*), **Recent oce graphic investigations in the Gulf of California.** *Journal of Marine Research,* New H Conn., 18(1):10–35, June 30, **1959.** 16 figs., 3 tables, 13 refs., 5 eqs. **DWB, DLC**—Resul seven hydrographic cruises into the Gulf of California during 1956 and 1957 show that the mass there is characteristic of Equatorial Pacific water though modified by intensive evapor in surface layers. The combination of wind regime and complicated topographical features

redominant role in circulation, upwelling, distribution of temperature and other hydrographic
tors. Seasonal changes are large. An estimate of the water budget indicates that exchange
ween the Gulf and the Pacific Ocean is of the order of $10^6 m^3/sec$. Evaporation in the Gulf
about $5 \times 10^3 m^3/sec$. Runoff and precipitation are negligible. Sea level records were studied
interpreted in terms of geostrophic surface flow. Strong tidal currents in many parts of the
lf are influencial in mixing the water. *Subject Headings:* **1. Oceanographic investigations**
Water masses 3. Gulf of California.—*Authors' abstract.*

12M–1070 551.526.64:551.464/5(262.5)
Khlopov, V. V., **Koeffitsient peremeshivaniia i ego izmeneniia s glubinoĭ i vo vremeni**
a otkrytoĭ chasti Chernogo moria. [Mixing coefficient in the open part of the Black Sea
its variations with depth and time.] *Moscow. Gosudarstvennyĭ Okeanograficheskiĭ Institut,*
udy, No. 47:30–37, **1959.** 4 figs., 6 tables, 6 refs., 8 eqs. **DWB**—The method of temperature
ves is applied to the calculation of approximate values of the coefficients of mixing, especially
the central portion of the Black Sea. Curves of annual variation at the horizon of 0, 50 and
0 m constructed from mean long-period data for one of the central regions of the Black Sea
used. The formula for computing the mixing coefficient K according to difference of am-
tudes is

$$K = 0.19 \times 10^{-3} \left(\frac{z_2 - z_1}{\lg \frac{A_1}{A_2}} \right)^2$$

d according to shift of phase is

$$K = \left[\frac{1.84(z_2 - z_1)}{\varphi_2 - \varphi_1} \right].$$

ith the aid of Fjeldstad's method, the author calculated the variation of the coefficient of
bulent heat conductivity with depth. The maximum value of the coefficient was observed in
surface layer and the minimum in the 50–75 m layer. This layer coincides with the layer of
ximum stability produced by the constant jump of salinity and by the limited mixing at these
pths. Below the 50–75 m layer, the coefficient increases somewhat and then diminishes toward
bottom. The curve of variation of the coefficient with depth for the Black Sea differs from
at obtained by Fjeldstad end Shtokman for the ocean. The equation of heat conductivity is
ed to calculate the variation of the coefficient with time. The maximum values of this co-
icient correspond to the winter months (Oct.–April), and the minimum value to the summer
onths (May–Sept.). From the comparison of the annual variation of the mixing coefficient
th the variation of mean wind velocity, solar radiation, and heat exchange it follows that heat
change and amount of solar influence exert the greatest influence upon the variation of the
xing coefficient. The order of magnitude of the coefficient of horizontal mixing according to
servations on currents in the northeastern region and the Yalta region was determined. *Subject*
adings: **1. Mixing coefficient 2. Black Sea.**—*I.L.D.*

12M–1071 551.465:551.526.6(572)
Speranskaia, A. A. (*Faculty Physics Moscow State U.*), **Turbulent processes within the**
ub-ice" layer of a basin. *International Oceanographic Congress, 1st, N. Y., 1959, Preprints of*
stracts of papers. Issued Wash., D. C., AAAS, **1959.** p. 422–426. 2 figs. In English and
ssian. **DWB** (551.46082. I61pr)—Some results of the measurements of the turbulence of
ter masses in the "sub-ice" layer of a basin under conditions of heterogeneous density, are
scribed. The observations made in a part of the Baikal Lake near the Angara River during
winter of 1958 consisted of the simultaneous registrations of the vertical and horizontal com-
nents of the mean current velocity, the turbulent fluctuations of the horizontal and vertical
mponents of the current velocity, the mean water temperature, and the turbulent fluctuations
the water temperature. *Subject Headings:* **1. Water mass turbulence 2. Lake Baikal,**
iatic U.S.S.R.—*I.S.*

12M–1072 551.46:378.4
Stewart, R. H. A., **Oceanography at Dale Fort.** *Weather,* London, 14(10):327, Oct. **1959.**
WB—A short note on the oceanography course held at the Dale Fort Centre of the Field Studies
uncil from Aug. 26 to Sept. 2, 1959. The observations were made in the Center's 30-ft fishing
at. Soundings, temperature measurements, extinction and salinities were carried out. A whole
y was devoted to the study of the waves. In the evening the result of observations were plotted
base maps, thus gradually constructing an oceanographic picture of Dale Roads and surround-
waters. *Subject Headings:* **1. Oceanographic investigations 2. Dale Fort, Eng.**—*I.S.*

12M–1073 5

Fredriksson, Kurt (*S.G.U., Stockholm, Sweden*), **On the origin, age and distributio
"cosmic spherules."** *International Oceanographic Congress, 1st, N. Y., 1959, Preprint
abstracts of papers.* Issued Wash., D. C., **1959.** p. 456–458. table. German summary p.
458. **DWB** (551.46082. I61pr)—A brief description of sediments examined for their conte
"cosmic spherules." Most of the data examined were gathered during the Swedish "Albat
Expedition. Accumulation of cosmic spherules on the Earth in metric tons per year is pres
in tabular form. The form, composition and size limits of the spherules suggest that most, i
all, of the spherules are formed as drops of melting material drawn off from the surface of b
meteorites during their flight through the atmosphere. *Subject Headings:* **1. Cosmic sphe
2. "Albatross" (Swedish Deep Sea) Expedition, 1947–1948.**—*I.S.*

12M–1074 551.462:523.16(265/

Laevastu, T. (*FAO of U. N., Rome*) and Mellis, O. (*Inst. of Mineralogy, Univ. of S
holm*), **Extraterrestrial black spherules in deep sea deposits.** *International Oceanographic
gress, 1st, N. Y., 1959, Preprints of abstracts of papers.* Issued Wash., D. C., AAAS,
p. 464–466. fig., table. German summary p. 465–466. **DWB** (551.46082. I61pr)—Characte
features of black spherules in deep sea deposits are described in this paper. Numbers of
spherules and their weight in some levels in a sediment core from the central Pacific Ocea
presented in tabular form. A diagram showing magnetic fraction and number of black sphe
in a core is also given. It is concluded that the rates of sedimentation or variations in the am
of cosmic dust reaching the surface in the past, cannot be determined by the quantity of
spherules. *Subject Headings:* **1. Extraterrestrial deposits in deep sea 2. Black spherul
deep sea deposits 3. Central Pacific Ocean.**—*I.S.*

12M–1075 551.462:551.351.3

Bader, Richard G. and Henry, Vernon J. (*both, A. & M. College of Texas*), **Marine
ments of Prince of Wales Strait and Amundsen Gulf, West Canadian Arctic.** *Journ
Marine Research,* New Haven, Conn., 17:35–52, **1958.** 4 figs., 2 tables, 17 refs. **DWB, D**
52 marine sediment samples from Prince of Wales Strait and Amundsen Gulf have been ana
for properties such as grain size and rock and mineral composition. It appears that the dist
tion of the various sediment types in the area investigated is markedly influenced by both s
location and sea ice. *Subject Headings:* **1. Marine sediments 2. Arctic Ocean.**—*Au
abstract.*

12M–1076 551.462:551.351.5

Blanc, J. J.; Pérès, J. M. and Piccard, J. (*all, Faculté des Sciences de Marseille*), **C
profonds et thanatocœnoses quaternaires en Méditerranée.** [Deep coral reefs and Quate
thanatocoenoses in the Mediterranean.] (In: France Centre National de la Recherche
tifique, **La topographie et la géologie des profondeurs océaniques.** Paris, **1959.** p. 185
6 refs. English summary p. 185.) **DLC** (GC83.F7)—In NE Atlantic and Mediterranea
are two different levels of deep Coral-reefs: the first one at the highest level of the conti
slope (bathylittoral) with *Dendrophyllia;* the second one on the slope (except the highest
with *Madrepora, Lophelia* and several others. Present deep Coral-reefs of the Mediterr
Sea are relicts of the recent Quaternary. Formerly, these reefs were much more numerou
thriving than presently, because: 1) the slope was less muddy; 2) the deep-currents were str
giving a better distribution of organic and mineral nutrients. The highest prosperity of
deep Coral-reefs took place in the Tyrrhenian. *Dendrophyllia cornigera* (yellow coral) pr
disappeared during the Würm-period, and, after, came again. On the contrary, white-
(*Madrepora, Lophelia*) were probably more and more decreasing, and are presently almost
submersed by the mud. During the Grimaldian, the death of the reefs was followed by s
alterations, which are described. *Subject Headings:* **1. Coral reefs 2. Mediterranean
*Authors' abstract.***

12M–1077 551

Carruthers, J. M. (*National Inst. of Oceanography, U. K.*), **Description of a prot
gauge to measure magnitude and direction of hydrowire slope *in situ* between reve
bottles at all depths and under all conditions of ship drift.** *Journal of Marine Res
New Haven, Conn., 17:113–119, **1958.** 4 figs., 4 refs. **DWB, DLC**—The discovery in
years of vast deep oceanic currents running in a direction contrary to those at the surface
vides additional evidence of our need for instrumental means to obtain accurate data on
surface waters, particularly in little known oceanic areas where pioneer lowerings are to be

escription is given of a prototype messenger-operated wire-angle gage which, used intermedi- between reversing bottles, can furnish information on the direction of slope of the hydrowire its actual degree of obliquity at a number of points. It is only the latter, of course, which be computed from results obtained when unprotected reversing thermometers are used with pressure-resisting type. *Subject Heading:* **Hydrowire slope measuring instruments.**—*hor's abstract.*

12M–1078 551.463/4:061.3

Cooper, L. H. N. (*Marine Biological Lab., Plymouth, Eng.*), **A system for international ex- nge of samples for trace element analysis of ocean water.** *Journal of Marine Research,* Haven, Conn., 17:128–132, **1958.** **DWB, DLC**—The hazards inherent in sampling at sea trace element analyses are discussed. It is proposed that a discussion be held at Helsinki in on: (a) sampling for trace element analysis; (b) a system for international exchange of ples and for reciprocal control of methods for analysis of trace elements. *Subject Headings:* **race element analysis 2. Ocean water sampling 3. International exchange of water ples.**—*Author's abstract.*

12M–1079 621.396.96

Croney, J., **The reduction of sea and rain clutter in marine radars.** *Institute of Navi- on, London, Journal,* 7(2):175–180, April **1954.** 8 figs., 2 refs., 5 eqs. Discussion p. 190– **DLC**—Describes the principle of the logarithmic receiver, which greatly diminishes the er. *Subject Heading:* **1. Radar noise.**—*C.E.P.B.*

12M–1080 539.16:551.46

Folsom, Theodore R. (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Problems related to direct ological measurements at sea.** *National Research Council, Wash., D. C., Publication,* No. :50–57, **1957.** 5 figs. **DWB** (551.46 N277pr), **DLC** (GC57.N33,1956)—The Scripps Inst. ceanog., Calif., has successfully identified the very thin laminar strata of deep stratified water neans of radioactive materials. The operation of this new method and the apparatus in use described in this note. *Subject Heading:* **1. Radiological measurement techniques.**—*N.N.*

12M–1081 551.462:551.351.3:553.88(268)

Goldberg, Edward D. (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Determination of opal narine sediments.** *Journal of Marine Research,* New Haven, Conn., 17:178–182, **1958.** 2 , 2 tables, 2 refs. **DWB, DLC**—The opal contents of recent marine sediments are ascertained onversion of the opal to crystobalite by heating and by a subsequent quantitative x-ray diffrac- analysis of the crystobalite. An opal stratigraphy is evident in Bering Sea deposits. Further, opal concentrations appear to be covariant with barium, an element previously as indicative of ogical productivity in overlying water masses. *Subject Headings:* **1. Opal in marine sedi- ts 2. Barium in sea water 3. Bering Sea.**—*Author's abstract.*

12M–1082 551.465

Hansen, Walter (*Univ. of Hamburg*), **Hydrodynamische Methoden in der Ozeanographie: räge zur Physik der Bewegungsvorgänge im Meere.** [Hydrodynamic methods in oceanog- y: contributions to the physics of sea motion phenomena.] *Geofisica Pura e Applicata,* Milan, 54–167, Sept./Dec. **1959.** 6 figs., 10 refs., eq. English summary p. 154. **DLC**—Considers far the events of motion in the sea can be reproduced by application of methods, which are d on the hydrodynamical differential equations. In particular, comparisons between observed computed sea-levels for the tides in estuaries and in the North-sea are worked out. Further a method is communicated, which gives the shape of the sea-surface, when distribution of ity is known, without using a layer of no motion. The result shows a remarkable agreement the topography of the sea-surface in the South-Atlantic given by A. DEFANT. *Subject Head- :* **1. Oceanography 2. Physics of sea motion 3. Sea level variations 4. Hydrodynamic ations.**—*Author's summary.*

12M–1083 551.46

Iselin, Columbus O'D. (*Woods Hole Oceanog. Inst.*), **Along what paths is physical oceanog- y likely to proceed?** *National Research Council, Wash., D. C., Publication,* No. 473:6–9, .. **DWB** (551.46 N277pr), **DLC** (GC57.N33,1956)—The problems and requirements of physi- ceanography are discussed in this paper. A necessary factor in physical oceanography is the lopment of convenient, long-range navigational techniques as well as means of measuring slow ons deep down in the ocean. The developments so much needed in this field are the elimina-

tion of the cable problems, ideal ships, buoys, radio telemetering and instruments with more
nected cables. *Subject Headings:* **1. Physical oceanography 2. Progress in oceanograp**
N.N.

12M–1084 551.464:546.21:61
Marshall, S. M. and Orr, A. P. (*both, Marine Station, Millport, Scotland and Woods*
Oceanog. Inst.), **Some uses of antibiotics in physiological experiments in sea water.** *Jo*
of Marine Research, New Haven, Conn., 17:341–346, **1958.** fig., table, 10 refs. **DWB, D**
The oxygen content of sea water can be kept constant by use of antibiotics for periods up to
than a fortnight. With living animals present, the bacteriostatic effect probably lasts for a sh
time. Chloromycetin was the most effective antibiotic used; streptomycin was also satisfa
However, some samples of chloromycetin may prove harmful to marine animals; it some
inhibited the feeding of copepods. A combination of chloromycetin and streptomycin p
suitable for controlling bacterial action in measurements of phosphorus excretion. Since
not know the original bacterial content of the sea water used, the results are bound to vary
one experiment to another, but in general the use of antibiotics can extend the scope and acc
of physiological work. *Subject Headings:* **1. Oxygen in sea water 2. Antibiotics i**
water.—*Author's abstract.*

12M–1085 551.465:639.2:
Neue Forschungsversuche zur Bekämpfung der Ölverschmutzung. [New investig
for fighting oil pollution.] *Wetterlotse,* Hamburg, No. 71:104–108, May **1954.** fig. **D**
Refers to the rapid increase of oil-burning tonnage and the British "forbidden zone" for disch
oil in relation to ocean currents. The plan for dropping cellophane envelopes into the
described. *Subject Heading:* **1. Oil pollution of sea.**—*C.E.P.B.*

12M–1086 551.465:5
Rigby, J. Keith and Burckle, Lloyd H. (*both, Dept. of Geology, Brigham Young Univ.,*
Turbidity currents and displaced fresh water diatoms. *Science,* Wash., D. C., 127(3313)
June 27, 1958. 13 refs. Comments by R. W. Kolbe, *Ibid.,* p. 1504–1505. **DLC**—Deals
divergent theories to explain the distribution of diatoms. The authors accept as tenable th
Ocean Current theory and (2) the Aeolian theory but do not accept (3) the Atlantis Ma
theory as offered by Kolbe to explain the abundance and distribution of displaced fresh
diatoms in deep-sea cores of the Atlantic Ocean. The authors feel that turbidity current
be an additional explanation for the diatom distribution but Kolbe does not agree with this
completely since the turbidity current would have had to carry the load 930 km, climb 1
and then dump the diatom load on top of Core 234 which was 3577 m deep and was surro
by 4586 m and 4967 m depths. He reaffirms his belief in Malaise's theory. *Subject Hea*
1. Turbidity currents 2. Diatom distribution 3. Atlantic Ocean.—*W.N.*

12M–1087 551.46
†Symposium on Saline Water Conversion, (*Wash., D. C.?*), **Nov. 4–6, 1957, Procee**
of a conference sponsored by the National Academy of Sciences—National Research C
and the Office of Saline Water, U. S. Dept. of the Interior. Ed. by Martin A. Mason. *N*
Research Council, Wash., D. C., Publication No. 568, **1958.** 459 p. figs., tables, bibliog
refs.), eqs. **DWB** (628.16 S989)—The symposium of Nov. 1957 covered the present tren
activities in research on saline water conversion. Section 1 contains description of some
research in the U.S.S.R. and in other parts of the world. Sections 2 through 5 contain
sions of the various methods of distilling and conversion of saline water. The last section
marizes developments along these lines such as the application of thermodynamics and n
facilities to the problem. *Subject Headings:* **1. Oceanographic studies 2. Saline water**
ment 3. Salt water treatment 4. Desalting methods 5. Symposium on saline wate
version. I. Mason, Martin A. (*ed.*).—*N.N.*

12M–1088 551.5(05
Work of the year (ending 31st March 1955) of the Marine Division of the
Meteorological Office and the voluntary observing fleet. *Marine Observer,* 25(169):12
July **1955.** fig., 6 tables. *Also* . . . **year ending 31st March, 1958.** *Ibid.,* 28(181):11
July **1958.** fig., 4 tables. *Also* . . . **year ending 31st March, 1959.** *Ibid.,* 29(185):96–10
1959. fig., 2 tables. **DLC**—Report of work of some 500 voluntary observing ships, ocean w
ships, marine climatology, etc. and list of awards. *Subject Headings:* **1. Progress repo**
Marine meteorology 3. Oceanographic research 4. Great Britain.—*C.E.P.B.*

12M–1089

551.46:532.1

Yoshida, Kozo and Tsuchiya, Mizuki, **Note on the thermosteric anomaly.** *Oceanographical*
ociety of Japan, Journal, 13(4):127–129, **1957.** 2 figs., 2 refs., eqs. Reprinted as *Tokyo.*
niv. Geophysical Institute, Geophysical Notes, 11(1), Contribution No. 9, **1958. DWB**—The
mplified method for the computation of dynamic height anomaly proposed by MONTGOMERY and
OOSTER (1954) and by KLEIN (1955) is examined for about 250 stations over the north Pacific.
he present study indicates that the integrated pressure terms for the dynamic height anomaly,
rface over 1000 db, can be evaluated in terms of temperature only at 600 m level with sufficient
curacy. The errors introduced by this replacement are found less than 1 dyn. cm for various
eas of different water masses. *Subject Headings:* **1. Dynamic height anomalies 2. Thermo-**
eric anomalies.—*Author's abstract.*

AUTHOR AND SUBJECT INDEXES

In this section will be found reference to the number given at the head of each abstract, 12M–1 through 12M–1089. This index is divided into three parts:

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